DOCUMENT RESUME

ED 436 650 CE 079 498

AUTHOR Ahola, Sakari
TITLE The Matching of Educational and Occupational Structures in Finland and Sweden. Final Report. CEDEFOP Dossier.
INSTITUTION European Centre for the Development of Vocational Training, Thessaloniki (Greece).
ISBN ISBN-92-828-8008-7
PUB DATE 1999-00-00
NOTE 74p.
AVAILABLE FROM Bernan Associates, 4611-F Assembly Drive, Lanham, MD 20706-4391. Tel: 800-274-4447 (Toll Free); E-mail: query@bernan.com; Web site: <http://www.bernan.com> (catalogue no. HX-24-99-825-EN-C, free).
PUB TYPE Reports - Research (143)
EDRS PRICE MF01/PC03 Plus Postage.
DESCRIPTORS Career Choice; Comparative Analysis; Education Work Relationship; *Educational Certificates; Educational Needs; Educational Research; Foreign Countries; Job Skills; *Occupational Information; *Occupations; Outcomes of Education; Postsecondary Education; *Profiles; Secondary Education; *Student Certification; Student Characteristics
IDENTIFIERS *Finland; *Sweden

ABSTRACT

This report studies the matching of educational and occupational structures in Sweden and Finland by using classifications that include all educational and occupational groups. By using comprehensive databases available in Finland and Sweden, it aims to develop the methodological and theoretical perspectives of the research on education and occupations to gain a clearer understanding of the matching of education and occupations and of the factors accounting for the differences between the occupational profiles of similar educational programs. Parts 1 and 2 discuss some basic aspects of the underlying school-to-work transition problem and the matching framework. Part 3 describes the data sets and the basic classifications used in the occupational profile analysis. Part 4 provides basic information on the features of Swedish and Finnish educational and occupational structures and the changes during the 1980s. Part 5 on tertiary education and Part 6 on secondary education summarize the key findings of the analysis of occupational profiles applying the similarity and domain indexes to the 1990 data sets. Part 7 presents the analysis of age differences and changes in time. Part 8 presents an experimental matching analysis. Part 9 offers conclusions. Appendixes contain 39 references, educational and occupational classifications, and similarity and domain indexes. (YLB)

Reproductions supplied by EDRS are the best that can be made
from the original document.

ED 436 650

CEDEFOP

European Centre for the Development of Vocational Training

DOSSIER

The matching

Final report

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

☑ This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

PERMISSION TO REPRODUCE AND DISSEMINATE THIS MATERIAL HAS BEEN GRANTED BY

J. Van Rens

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

1

CE 079 458

BEST COPY AVAILABLE

2

The matching of educational and occupational structures in Finland and Sweden

Final report

Author:
Sakari Ahola

University of Turku
Research Unit for the Sociology of Education
Hameenkatu 1
FIN-20014 University of Turku

Tel. (358-2) 333 65 33
Fax (358-2) 333 65 24

on behalf of CEDEFOP — European Centre for the Development of Vocational Training

Editors:
Burkart Sellin, Project co-ordinator — CEDEFOP
Stavros Stavrou, Deputy Director — CEDEFOP

Thessaloniki 1999

Published by:
CEDEFOP — European Centre for the Development of Vocational Training
Evropis 123, GR-57001 THESSALONIKI (Pylea)

Postal address:
PO Box 22427, GR-55102 THESSALONIKI

Tel. (30-31) 490 111
Fax (30-31) 490 020
E-mail: info@cedefop.gr
Homepage: www.cedefop.gr
Interactive website: www.trainingvillage.gr

The Centre was established by Regulation (EEC) No 337/75 of the Council of the European Communities, last amended by Council Regulation (EC) No 251/95 of 6 February 1995 and Council Regulation (EC) No 354/95 of 20 February 1995.

A great deal of additional information on the European Union is available on the Internet.
It can be accessed through the Europa server (http://europa.eu.int).

Cataloguing data can be found at the end of this publication.

Luxembourg: Office for the Official Publications of the European Communities, 1999

ISBN 92-828-8008-7

© European Communities, 1999
Reproduction is authorised provided the source is acknowledged.

Printed in Belgium

Preface

This study report has been commissioned by CEDEFOP in the framework of its Ciretoq network on trends in occupations and qualifications to the Research Unit on Sociology of Education at the University of Turku. The Swedish Statistics collaborated in the harmonising of the educational and occupational classifications and prepared the Swedish data so that the necessary comparisons between Finland and Sweden could be made. The main research work has been carried out by RUSE.

The method applied for studying the matching of educational and occupational structures between two countries was originally developed by the Research Centre for Education and Work at Maastricht University together with the Economic and Social Research Institute in Dublin. Both performed a first survey on behalf of CEDEFOP comparing the figures in the Netherlands and in the Republic of Ireland, which was published in 1998 (see Borghans et al. under references).

This study was initiated by the Swedish and Finnish Members of Ciretoq in 1998 and CEDEFOP took the decision to support this work financially. Finnish authorities and more specifically the Ministry of Education contributed substantially too. Our thanks go to all those who assisted the author with this difficult task and especially to Mr Olli Poropudas who participated on behalf of the Ministry of Education.

The study shows the usefulness of such comparisons because it highlights a number of important elements linked to common as well as to certain contradictory developments. It is, for instance, very interesting to note that in both countries there seems to be a large degree of 'mismatch' between delivery of qualifications and their actual employment characteristics; and, at the same time, we can affirm a rather high overlap in the actual use of different qualifications within the same occupational domain, which the author calls 'multimatch'. Thus, it is highly questionable whether and how far the often heard plea for a closer 'matching' of educational qualifications and occupational domains or structures is realistic any more.

The contradictions are going further: in certain fields we seem to have a widening of occupational domains while in others we have a narrowing down of occupational domains by respective qualifications. Real specialists in VET policy and guidance are therefore neither arguing for too narrow a specialisation nor for an often rather superficial flexibility, they basically argue for a 'flexible specialisation' during initial education and training, an argument which could form the major conclusion of this work.

Burkart Sellin

Ciretoq Co-ordinator

Thessaloniki, December 1998

CONTENTS

Preface 1

Introduction 5

Transition from school to work – Old problems in a new setting 7

The matching framework 9

Data and classifications 13

Educational and occupational structures in Sweden and Finland 15

Educational expansion 15

Occupational change 18

Occupational profiles in tertiary education 27

Arts and humanities 27

Teacher training 30

Social and behavioural sciences 30

Engineering and natural sciences 34

Medical and health care education 36

Other tertiary education 37

Concluding remarks on tertiary profiles 40

Occupational Profiles in Secondary Education 43

Humanities, teacher training and SB-programmes 43

Secondary technology programmes 47

Other secondary programmes 49

Changing Occupational Profiles – Some Complementary Findings 51

The matching 57

Conclusions 61

References 65

Appendixes 69

Appendix A: Educational classification 69

Appendix B: Occupational classification 73

Appendix C: Similarity and domain indexes 77

Introduction

This project took as its starting point the ideas of the study on occupational profiles in Ireland and the Netherlands (Borghans, Hughes & Smits 1998). The aim is, by taking use of the comprehensive databases available in Finland and Sweden, to develop both the methodological and theoretical perspectives of the research on education and occupations to gain a clearer understanding of the matching of education and occupations and of the factors accounting for the differences between the occupational profiles of similar educational programmes.

By introducing complete data on both the educational and occupational structures, the differences and functioning of the educational systems in Finland and Sweden can be analysed within different fields of employment. For instance, the conditions of matching vary considerably between the professional field, the field of basic vocational qualifications and the field of unqualified labour. In addition, such important variables as age and gender will be used to study the differences between recent graduates and older workers, or between female/male dominated education/occupations. Introducing similar data for 1980 and 1990 also enables controlling the changes in time and making estimates of future trends. The Finnish-Swedish results are not directly comparable with the Dutch-Irish study although, some general assessments are in order to develop further this kind of matching research so that it will be come more broadly applicable in the European context.

In this final report, some of the basic aspects of the underlying school-to-work transition problem and the matching framework will be discussed. The second part gives a short description of the data sets and the basic classifications used in the occupational profile analysis. The third part gives some basic information on the features of Swedish and Finnish educational and occupational structures and the changes during the 1980s. The two following chapters summarise the key findings of the analysis of occupational profiles applying the similarity and domain indexes to the 1990 data sets. The next chapter presents the analysis of age differences and changes in time. Finally, an experimental matching analysis is presented.

Transition from school to work – Old problems in a new setting

Since the 1970s, the transition from school to work has been a growing problem for national governments and international organisations. It has also been a popular subject for research in the academic sphere. In the secondary vocational sector, the main concern behind the interest in the transition process was the growing youth unemployment and the threat of marginalisation facing early school leavers and drop-outs. In the higher education sector, in addition to the relatively minor problems of unemployment caused by the oil crisis, the massification of higher education and the growing pressures from governments and from society at large brought the questions of transition and employment into the limelight (Unesco 1983; OECD 1983; OECD 1992).

Research and public debates during the 1970s and 1980s were focused on societal and manpower planning. In Finland as well as in Sweden this was connected to the reorganisation of central government and administration, the consequent growing of the *corps bureaucratique*, and the building up of the welfare state, where education played a special role. The growth of the welfare state provided jobs for a huge number of white-collar employees in the public sector, especially for higher education graduates. In the Nordic countries, for instance, the public sector continued to absorb over half of new university graduates until the 1990s. Nowadays this situation is rapidly changing: future graduates will face a completely different situation when trying to find employment.

The use of manpower projections is connected to the debate about the impact of economic and technical development on the requirements of skills, education and training imposed on the labour force. After the launching of the ideas of Bell (1973) and Braverman (1974), it has been gradually accepted that structural changes in labour market and society lead both to skilling and deskilling effects. Tasks related to production go into decline and the level of required skills falls. Tasks related to the installation, maintenance, service, and programming of production and production equipment on the other hand expand and as the equipment becomes more complex, the tasks too become more complicated and require higher skill levels (Senker 1989).

The so-called polarisation thesis claims that both the tasks faced at work, and thus also the labour force, are becoming increasingly polarised into two groups: the highly educated, who are working with tasks requiring specialist qualifications; and those with limited education, who are deployed in the performance of low-skill tasks (Gallie 1991). According to Spenner (1985), however, unambiguous empirical evidence of deskilling has not been established, despite the fact that some case studies have revealed falling levels of qualifications. Ultimately, the problem is also one of defining what is meant by 'qualifications' or 'working skills', and how these are to be measured (Lewis 1996). The only enduring feature is that in all industrialised countries, the basic trend is towards a continuous rise in the population's educational level.

In the late 1980s and during the 1990s, new approaches to the school-to-work transition emerged. The continuing expansion of education, especially the massification and diversification of higher education systems brought the questions of quality and relevance of

teaching and the accountability of the whole educational system onto the agenda of national reforms (Neave 1996). The transition is no longer an exogenous variable in the art of inferring from manpower forecasts to the educational planning process; it is an endogenous part of the new educational strategy aiming at quality and efficiency. In Finland, the employment of graduates is already a part of the assessment criteria of higher education which has also potential funding implications.

At present, there are problems of mismatch between demand and supply in the educational market as well as in the labour market. The courses of study for which places are available do not correspond to young people's aspirations; and on the labour market, both numbers of skilled workers on the dole and a shortage of skilled workers can be found simultaneously. Centralised educational planning has so far failed to fuse in a rational manner the manpower projection approach derived from the investigation of the population's educational preferences. (See Psacharopoulos 1986; 1991.)

The prevailing assumption is that the educational aspirations of the young can be steered through advice, careers counselling, and the more effective provision of information. In addition, opportunities have been created for students to acquire work experience, in the belief that this will contribute to meeting the needs generated by the economy. At the moment, various from-school-to-work-programmes are being developed everywhere.

The matching framework

A lot of the theorising on the relationship between education and working life derives from economics and is concentrated on the functioning of the (neo-classical) markets. The human capital theory, for instance, interprets employment as a matching of demand and supply in a perfect market. Many subsequent sociological approaches have tried to explain why the markets fail in the employment process (Rosenbaum et al. 1990). Those, for instance, who emphasise more the cultural or symbolic function of education point out the importance of stability, learnability and conformity to current norms (cf. Bridges 1996).

Especially in the field of higher education, the concept of credentialism (e.g. Collins 1979) has been used to describe how rewarding jobs have been monopolised by the holders of certain degrees and certificates. However, it is still quite unclear how well academic studies are tied to the skills required in working life. According to the signalling theory, for instance, employers use educational credentials as proxies for employee productivity because the labour market lacks complete information on them.

In addition to the human capital tradition and its 'counter hypothesis', there is very little theorising on the transition process itself. The field seems to be divided into those who concentrate on educational stratification and those who are interested in occupational stratification. In the middle, labour market theorists dwell upon questions like segmentation. Up till now, there has been only limited communication between these groups (Kerckhoff 1996).

The notion of matching originates from Sørensen and Kalleberg (1981) and was further developed by Granovetter (1981). The main interest was in the determination of earnings where education is supposed to play the key role. The idea was that in employment relationships, characterised by social closure, and on markets where vacancy competition is more probable than wage competition, the matching process is an independent variable along with individual and job determinants explaining how individuals with a certain educational background end up in certain occupations.

Analysing the relations between educational and occupational structures by using statistical data on occupational and educational profiles poses various problems. One is the emerging dilemma of accounting simultaneously for the effects of educational qualifications and occupational requirements – not to mention their interaction – in the placement process.

The following figure clarifies the problem. If we look at the empirical reality in the form of statistics, which is the starting point of educational planning, we can see that certain educational programmes lead to specified occupations while others give access to more diverse positions in working life. Similarly, when we look at the tasks and positions in work: certain occupations are open to only those possessing the right qualifications, while others employ from a diversified educational pool. The matching of these dimensions has been the enduring question in educational planning. With both dimensions we should carefully separate the 'qualification-theoretical' aspect from the empirical reality. Most educational programmes are designed to produce qualifications for specific occupations. The outcomes of matching are, of course, a different story.

In both cases, the problem is connected to the types of qualifications produced and needed, for instance, to the basic division between liberal and vocational education on the one hand, or general and specific qualification on the other.

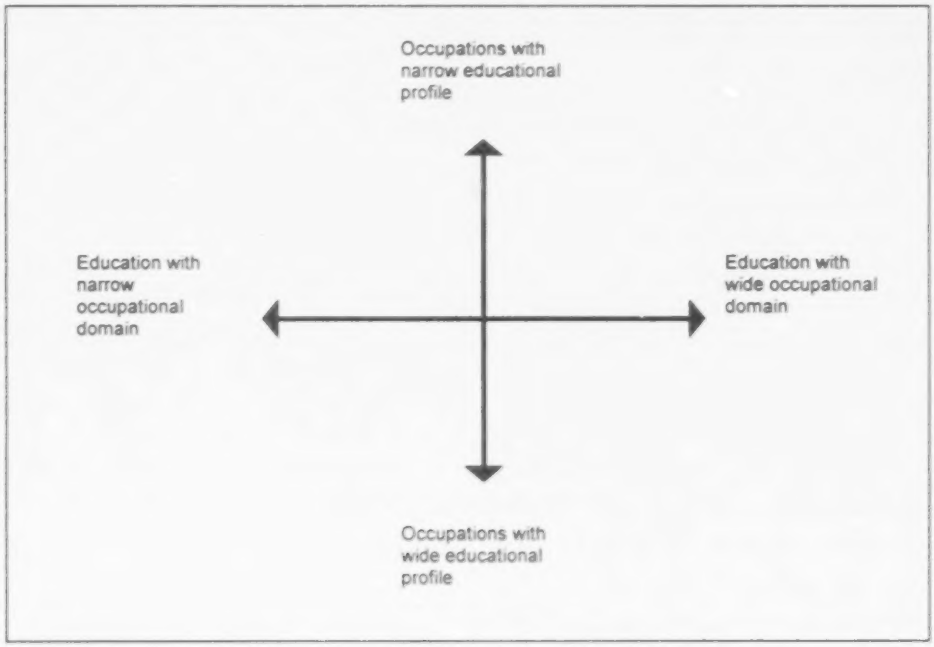

Occupations with narrow educational profile
Education with narrow occupational domain
Education with wide occupational domain
Occupations with wide educational profile

Fig. 1. The matching of educational and occupational structures

In order to study the four fields in the crosstabulation from the point of view of the matching process, we would need some kind of definition for *a match*. In some cases, it is relatively easy to define the match. In others it is more difficult or does not make sense at all. This is the so-called 'grey area' of quantitative educational planning (Ahola, Kivinen & Rinne 1992b). In addition to the theoretical implications, this is also a crucial practical question in the ongoing structural change. It seems that the whole idea that there is, or has ever been, something that can be defined as 'work which corresponds to one's education' is questionable. The results of a German study, for instance, clearly show that educational and occupational structures are relatively elastic, thus, reducing the changes of a close fit between the two (Whitte & Kalleberg 1995). Similar findings have been reported in the USA (Lewis et al. 1998).

In the upper left corner of the above figure, we have typically professional occupations. In this field there is a close match between education and occupation. In the upper right corner we find educations which lead to professionally closed occupations but to a greater extent also to other occupations.

In the lower left corner education is vocationally narrow, leading to certain occupations, although the qualifications needed in these occupations also give access to workers with various other competencies. And finally, the lower right corner is the field of typically low qualifications. Various educational programmes can be matched with different occupations.

There are three interrelated processes affecting the matching of education and occupations. The first is the expansion of education which has been very rapid in both Finland and Sweden. Most educational reforms have clear connections to the changing needs of the labour market but the expansion is also due to 'educational self-propulsion' which means that the educational level of the population rises irrespective of the changes in occupational structures and skill demands (Ahola, Kivinen & Rinne 1992a).

The second process encompasses the changes in occupational structures. The overall feature in all OECD countries is that the expanding occupations are mostly those where employees are relatively highly educated. This finding corresponds to the technical-functional theory of education and occupations. Technological changes, however, only partly explain the elevation of the overall qualification requirements (Collins 1971; 1979).

Thirdly, there are changes in skill demand within occupations. New technologies affect the qualification requirements of some employees. At the same time, however, especially in the context of old organisational structures, also dequalification occurs.

The matching of education and occupations is mediated through two market systems, the educational market and the labour market. Both are systems of controlling demand and supply, and systems of evaluation and allocation of positions and agents. As a rule, education qualifies mainly for the labour market, not for the work or occupation itself. However, there are also structures, like in the Japanese case, which connect schools and work places in a more direct way (see Masuda & Muta 1996). For instance, in Finland all universities have established their own employment centres helping graduates to find jobs and employers in searching for potential recruits.

Two independent dimensions of matching have been distinguished (see Ahola et al. 1991). The primary dimension of the matching process is the level of education which is connected to the stratification of society, to the class structures and to the reproduction of social positions. The field of study is a secondary dimension in the sense that it functions within the different levels of education. The level of education is connected on the one hand to the segmentation of the labour market and on the other to professionalisation. Workers with high educational qualifications end up in the primary segment where employment prospects are relatively good. Short vocational preparation leads to the secondary market where the overall unemployment situation is a crucial factor in the matching process. In the field of liberal higher education, the occupational domain is relatively wide. The clearer the vocational specificity of the educational programme, the more narrow is the occupational domain. The stronger the professional tendencies, the more narrow is the educational profile.

Finally, two types of qualifications affecting the matching process have been distinguished: those which are technically defined and those which are socially defined (Gulowsen 1988). Technical definition arises from the requirements of the work process and it leads to a tight relationship between education and work. Social definition reflects the interests of workers and professional groups. On the one hand, these interests lead to the formalisation of qualification requirements. On the other, when related to higher education, social definition brings some flexibility to the matching process.

Both types of qualifications are partly learned in the work place. Because of the importance of on-the-job skills, which are usually tacit in nature, formal education 'explains' only partly the observed matching of educational and occupational structures (Ahola et al. 1991).

We can separate between at least five types of factors accounting for the differences in occupational profiles of basically similar educational programmes:

1. Supply and demand in the labour market;
2. Possibilities for substitution of qualifications and skills;
3. Professional and governmental interests and regulations;
4. Inequalities and discrimination;
5. Individual preferences and interpretations of the match.

It is obvious that the following statistical analysis can only locate those educational programmes which have exceptionally different educational profiles. Thorough analysis of the above-mentioned potential causes of differences should be restricted to a few relevant educational fields but, at the same time, allow for more countries to participate in comparative studies. Thus, this kind of macro-sociological research has to be supplemented with more refined surveys also using the sectoral approach.

Data and classifications

Two similar databases were constructed using 1980 and 1990 censuses. The Swedish data comes from the population and dwelling survey (FoB). The Finnish data was extracted from the longitudinal census database which is also based on the Finnish population and dwelling surveys (VAL). Data include employed population (15-74 year olds) by sex, age and education. Total number of cases from the year 1980 in Sweden is 4,011,665 and in Finland 2,228,282. In 1990 data the figures are 4,491,516 in Sweden and 2,330,092 in Finland.

The educational classification used in this study is based on a Swedish application of their main education 'nomenklatur' (SUN). It separates between two levels, secondary (ISCED 3) and tertiary (ISCED 5-7) courses, and between seven fields: arts and humanities, teacher training, social and behavioural sciences, technology and natural sciences, transportation, medical and health care, agriculture, forestry and fishing and services. The total number of subgroups is 75. In addition, there are two groups for other secondary and tertiary education. The group 'basic education' differs in Sweden and Finland, and in the analysis it is combined with 'education unknown'. Appendix A shows the basic classification and the translation of the Finnish educational codes (see Statistics Finland 1989). To find out how the Swedish SUN-codes are grouped in the classification, see Statistics Sweden 1994, p. 177 and Statistics Sweden 1996.

Harmonising the educational classifications proceeded, first, by checking how different educational courses had been combined in the Swedish classification and, secondly, by identifying similar courses in the Finnish classification system. In spite of the basic similarity of the educational structures in Sweden and Finland, there were many differences in both the classification systems and course structures.

Appendix B includes the basic occupational classification listing the occupational codes in each country (see Statistics Sweden 1998 and Statistics Finland 1995, appendix 4). The classification divides occupations into eight main categories: technical, physical science, social science, humanistic and artistic; administrative, managerial and clerical; sales work; agriculture, forestry and fishing; mining and quarrying; transport and communications; manufacturing; and service. Both classifications are based on the Nordic Occupational Classification and they are fundamentally very similar. One important difference is that the Swedish classification does not separate engineers and technicians like the Finnish classification does. On the other hand, the Finnish classification tends to place certain shop floor level workers within their functional or industrial group, for instance, hospital attendants belong to medical and nursing workers. In the Swedish classification they are placed with other attendants in ' receptionists and messengers'.[1]

[1] The English translations of the occupational groups are a mixture of translations used in Swedish and Finnish statistics and they give just a general idea of the various individual occupations which are included in the groups.

Educational and occupational structures in Sweden and Finland

The educational systems in Finland and Sweden are basically very similar. They share a common history where Finland has usually imitated Swedish educational innovations and structural reforms. However, two important differences should be noted. First, while the Swedes developed their secondary system towards a comprehensive model (*gymnasieskola*) in the late 1960s, Finland has kept the general upper secondary school (*lukio*) apart from vocational schools. The *lukio* is important in the Finnish context and that is why it has its own group in the classification as mentioned above. Secondly, also in tertiary education, Sweden has developed a comprehensive higher education system where the university sector has on its side various types of vocational colleges. Finland had a uniform higher education system where all institutions had university status until 1992 when the experimental non-university institutions (*ammattikorkeakoulu*) were introduced. In addition to these structural differences, there are also various differences at curricular level which can not be fully accounted for in this project.

The differences in the occupational and educational structures are one potential source of variations in the occupational profiles in these countries. However, in both countries the implemented educational policy has been founded on the idea of occupational forecasting and matching of demand and supply. Thus, the starting point of the analysis is that the demand for a certain kind of labour has shaped the volume of corresponding education – considering the reservations mentioned before. Thus, if there is overproduction of graduates in relation to their normal occupational positions they have to find employment in other sectors. This relates to the question of vertical and horizontal substitution in the labour market. On the other hand, if there is shortage of qualified manpower, employers have to consider other options within the limits of their qualification requirements and various professional regulations.

In the Ciretoq group A meeting in Brussels some preliminary comparisons of the educational and occupational structures and changes during the 1980s in Sweden and Finland were presented (see Ahola 1997). At that time, all of the data was not yet available. The following tables are based on harmonised data sets and classifications and examine men and women separately, which gives more refined but also slightly different results.

Educational expansion

Table 1 shows the educational structures in 1990 by country and sex, using the main educational groups (see appendix A). The percentages have been calculated excluding those with 'other secondary and tertiary education and those with 'basic education only' or 'education unknown' because of classificational differences and problems. The shares of these groups vary considerably between Sweden and Finland but, as we can see from the table, together they account for about 40% of the population.

From those with education beyond the basic level, in Sweden 36% of both males and females have completed some kind of tertiary degree compared to 23% in Finland. An exception to this general pattern is that Finland seems to produce more tertiary agricultural degrees and female humanists than Sweden. In Sweden, women pursue slightly more tertiary technical degrees than their Finnish counterparts. On the secondary level, the situation is the other way around, except that Sweden is ahead in the production of health care and transportation diplomas. In addition, there are more males in Sweden that have secondary arts or SB-education than in Finland. A rather crude and general observation is that Finland invests in technical and agricultural education while Sweden concentrates more on social-administrative and health care education. Differences between the sexes, as we can see, are rather traditional.

If we look at the changes during the 1980s we can see basically a very similar pattern. In both countries, the number of the educated work force has been growing fast. In Sweden, the number of males having some kind of tertiary degree almost doubled (90%) between 1980 and 1990. The growth of female tertiary degrees was 134%. In Finland the corresponding figures are 41% and 63%. The fast growing groups of males having tertiary education include, in addition to technical education, especially agricultural programmes in Finland and teacher training in Sweden. Female educational growth in Finland has been strongly channeled into service sector programmes, agricultural and health education. In Sweden, in addition, the number of transportation programmes and SB-diplomas have also been growing fast.

Table 1. Educational structure in Finland and Sweden in 1990 by sex (%)

Main educational groups	**Males**			**Females**		
		FIN	**SWE**		**FIN**	**SWE**
Arts and humanities		1.50	1.84		3.64	2.49
Teacher training		1.64	5.02		4.81	12.63
SB-programmes		4.86	9.33		5.67	7.95
Technical educ.		11.15	13.00		2.20	2.01
Transportation		0.22	0.79		0.00	0.10
Medicine and health		1.57	2.81		5.94	10.25
Agriculture etc.		1.29	0.87		0.47	0.12
Services		0.82	2.98		0.23	0.44
TERTIARY ALL	23.05	36.64		22.96	35.99	
Arts programmes		0.35	0.68		0.96	0.71
Teacher training		0.39	0.12		0.68	0.11
SB-programmes		9.41	11.25		25.91	24.93
Technology prog.		52.40	39.60		11.44	3.80
Transport		1.37	3.46		0.16	2.01
Health care		1.02	1.53		15.00	23.22
Agricultural etc. prog.		7.81	4.11		2.58	0.73
Service programmes		4.20	2.59		20.29	8.50
SECONDARY ALL	76.95	63.36		77.04	64.01	
OTHER	40.02	43.59		40.71	36.85	
ALL		1197866	2333821		1134408	2157696

The following tables give a more detailed picture of the changes in the individual educational groups used in the profile analysis. We can see that there are very high growth percentages resulting partly from the fact that many of the educational programmes have been created during the 1980s. We can also see that in both countries typical growth programmes belong to the fields which have been traditionally strongly gender specific, for instance, the field of nursing for males and engineering or fire fighting for females.

There are also other structural and classificational changes behind these growth patterns. The upper tertiary teacher training (not separated in the classification) in the Finnish case is an example of growth produced by the 'academic drift' and changes in the educational structures. While educational programmes tend to become longer at all levels they also tend to establish themselves on a higher level in the classification. On the other hand, certain occupational functions, which have traditionally been outside formal education, have gradually been integrated into the system. However, this phenomenon dates back to the 1950s and 1960s, and the huge growth in the training of vehicle drivers in Sweden, for example, can be explained in terms of the changes in the classificational practices. (See Ahola 1997.)

Table 2. The fastest growing educational groups in Finland

Males	**Population 1990**	**Growth % 1980-90**
Physiotherapy	40	566.7
ADP	1097	560.8
Social care	134	378.6
Laboratory nursing	23	283.3
Basic nursing	589	234.7
Pre-primary teacher training	507	175.5
Other health prog.	1400	133.3
Fire fighting	2147	123.2
Other agriculture etc. prog.	6271	109.5
Vehicle programmes	5708	100
ALL	1197866	0.9

Females	**Population 1990**	**Growth % 1980-90**
Fire fighting	28	833.3
Other service education	1526	787.2
ADP	1054	516.4
Physiotherapy	939	415.9
Laboratory nursing	916	266.4
Engineering/construction	448	224.6
Veterinary medicine	400	200.8
Other agriculture etc. prog.	2119	182.2
Forestry programmes	225	181.3
Engineering/electro-tele	338	179.3
ALL	1143408	9.0

Table 3. The fastest growing educational groups in Sweden

Males	Population 1990	Growth % 80-90
Polytechnical programmes	7255	10728.4
Vehicle programmes	18128	10690.5
Employment	721	1702.5
Psychology	1708	1608.0
Fire fighting	5959	1484.8
Textile technology	1624	716.1
Maritime programmes	2853	666.9
Graphical technology	4030	643.5
Nursing	14158	584.6
Wood technology	18646	578.0
ALL	2333821	5.7

Females	Population 1990	Growth % 80-90
Vehicle programmes	2043	33950.0
Military education	233	23200.0
Psychology	3373	6513.7
Polytechnical programmes	1160	5423.8
Electro/tele-technology	3715	2138.0
Energy/vehicle technology	9996	1848.5
Fire fighting	17	1600.0
Employment	1206	1183.0
Wood technology	1169	1117.7
Police education	2140	980.8
ALL	2157695	19.6

Occupational change

Tables 4 and 5 describe the occupational change showing the occupational groups which are growing the fastest in relative terms during the 1980s. Again, the tables indicate quite similar structural patterns in Finland and Sweden. As in the case of educational expansion, men have also increased their share in traditional female occupations and vice versa. However, as we can see from the first column in Table 4 there are still relatively few men employed, for instance, in 'other housekeeping service work'. Thus, we should also look at the size of the occupational group when assessing the relative growth.

Rapidly growing occupational groups common to both countries belong to the typically expanding fields in commerce, ADP, services and health care. In addition, research and consultant workers in forestry, educational consultants, wholesalers and biologists are growing occupations in Finland. In the male list, we can also find engineering groups which have not been growing as fast as in Sweden. On the Swedish list, we find economists and statisticians, legal experts, psychologists and marketing promoters, for example. Thus, the growing occupations comprise mostly work requiring high qualifications although there are also examples of fast growing service sector occupations which do not require long theoretical education. There are only a few groups of blue collar occupations which have been growing during the 1980s and, in both countries, these are mainly fields of expanding female labour. In Sweden, the number of female painting workers has increased by 39%, for instance. In Finland the fastest growing female blue collar group was 'fine mechanical work' (61%).

The shrinking occupations mainly include basic production and manufacturing workers (see Ahola 1997). A telling example are the fur farm workers[2] which seem to have experienced in both countries a dramatic decline after the golden years of the early 1980s. For instance, in Finland the number of fur farm workers was 1824 in 1980, nearly 2000 in 1985 and only 368 in 1990. Another common feature is the decline of various clerical occupations. A good example of a totally vanishing occupation which is due to technological changes and automatisation, is lighthouse keeping in Finland.[3] Most of these occupations convey mainly older unqualified workers outside the work force or into unemployment and they are not very interesting in our analysis.

Table 4. The fastest growing occupational groups in Sweden between 1980-90

Men	Population 1990	Growth 1980-90%
Other housekeeping service work	231	327.8
Home helps	4208	308.1
ADP analysts and programmers	30746	122.8
Economists, statisticians	16752	121.1
Biologists	961	91.1
Other sci. and hum. occupations	2910	90.8
Corporation lawyers	2702	85.6
Wholesalers	10254	82.4
Kitchen assistants	7266	75.6
Cooks	9632	67.6
Nurses, midwives	4848	66.1
Other health care occupations	2048	63.3
Marketing promoters	14274	53.0
Physiotherapists, masseurs	3551	51.8
Child care in families	3634	46.9
Telephone operators	372	39.8
Psychologists	1841	39.8
Real estate agents and securities brokers	4252	39.2
Pre-primary teachers	2243	38.9
Coaches and trainers	3232	37.5

Women	Population 1990	Growth 1980-90%
Economists, statisticians	14567	565.2
Prison guards	4384	540.9
Airline pilots	71	446.2
Research and consulting in forestry	81	440.0
Railway traffic supervisors	778	389.3
Corporation lawyers	1257	389.1
ADP analysts and programmers	9630	261.8
Biologists	1001	248.8
Customs officers and border guards	768	238.3
Prosecutors and senior police officials	477	231.3
Marketing promoters	7104	221.4
Other health care occupations	2473	209.9
Auditors	5560	202.3
Real estate agents and securities brokers	1772	177.3
Road transport supervisors	803	170.4
Electro- and tele-engineers	4696	152.7
Insurance salesmen	761	147.1
Veterinarians	522	137.3
General business managers	2352	128.6
Air traffic controllers	2266	125.9

[2] They are included in the group 'agri- and horticultural workers'.
[3] This occupation is included in the group 'other occupations in transport'.

Table 5. The fastest growing occupational groups in Finland between 1980-90

Men	Population 1990	Growth 1980-90 %
Other housekeeping service work	56	833.3
Telephone operators	481	229.5
Physiotherapists, masseurs	2549	188.3
Pre-primary teachers	491	150.5
ADP analysts and programmers	14232	149.9
Travel agency clerks	321	145.0
Assistant nurses and receptionists	1857	138.7
Educational consulting	3531	136.3
Real estate agents and securities brokers	1687	131.4
Cooks	4170	118.4
Wholesalers	1260	117.2
Home helps	120	110.5
Other artistic and literary occupations	2522	109.1
Electro- and tele-engineers	24966	99.1
Nurses, midwives	1359	95.5
Research and consulting in forestry	4088	93.4
Biologists	440	86.4
Other religious work	1046	80.0
Chemical engineers	9872	76.8
Mechanical engineers	34721	76.6

Women	Population 1990	Growth 1980-90 %
Railway engine drivers	30	2900.0
Insurance salesmen	928	558.2
Firemen	55	450.0
Research and consulting in forestry	574	412.5
Airline pilots	10	400.0
Real estate agents and securities brokers	1058	372.3
Deck and engine room crew	309	281.5
Educational consulting	3595	262.8
Farmers, silvic-, horticulturists	70759	218.6
Musicians	1838	204.3
Other occupations in education	3074	197.9
Veterinarians	370	189.1
ADP analysts and programmers	6170	182.8
Prosecutors and senior police officials	45	181.3
Biologists	433	181.2
Coaches and trainers	1072	177.0
Burial service workers	207	176.0
Wholesalers	247	171.4
Surveyors and cartographers	435	166.9
Marketing promoters	3507	165.7

As noted above, one important structural difference, potentially affecting also the occupational profiles, is the variation in the marginal occupational distributions. These distributions are compared in Tables 6 and 7 which list all occupational groups where the relative difference exceeds 100%.

For instance, in Table 1 we can see that in Sweden the share of males working in child care in families is 64 times larger than in Finland. Swedish men also work relatively often as domestic helps, assistant nurses or pre-primary teachers. These are all typical female occupations in both countries. On the other hand, in Sweden females work more often

than in Finland in male-dominated occupations like prison guards, prosecutors, military officers, airline pilots or police officers.

It would seem that in Sweden men and women are more equally divided within the occupational system. However, if we take the domain view it appears that in Finland the similarity of male and female domains is slightly better (0.29) than in Sweden (0.34). Occupations which are more female dominated in Sweden include, for instance, prison guards, hotel receptionists, draftsmen and survey assistants, prosecutors and senior police officials. Compared to Sweden, in Finland women are more often employed as debt collectors, bath attendants, bus and tram drivers or pressing workers.

When we look at the occupations which are relatively large in Finland compared to Sweden, we can see the difference in agricultural occupations and related research and consulting work.

Another observation is that many of the miscellaneous groups appear in the Finnish table. This is one difference in the occupational classifications which should be accounted for in the following analysis. These miscellaneous groups are not interesting in the occupational profile analysis but we need them when the educational composition of occupational groups is studied and the matching framework applied.

Table 6. Relatively large occupational groups in Sweden compared to Finland

MALES	Sweden	%	Finland	%	S%/F%
Child care in families	3634	0.16	29	0.00	64.2
Domestic helps	4208	0.18	120	0.01	18.0
Bath attendants	720	0.03	28	0.00	13.2
Pressing workers	167	0.01	12	0.00	7.1
Cashiers in shops and restaurants	1315	0.06	104	0.01	6.5
Messengers, delivery boys	3624	0.16	340	0.03	5.5
Social insurance clerks	1985	0.09	193	0.02	5.3
Auditors	7376	0.32	786	0.07	4.8
Occupation not specified	242512	10.39	26908	2.25	4.6
Economists, statisticians	16752	0.72	1953	0.16	4.4
Assistant nurses and receptionists	15259	0.65	1857	0.16	4.2
Wholesalers	10254	0.44	1260	0.11	4.2
Kitchen assistants	7266	0.31	932	0.08	4.0
Bus and tram conductors	673	0.03	111	0.01	3.1
Travel agency clerks	1827	0.08	321	0.03	2.9
Personnel and employment service	17082	0.73	3195	0.27	2.7
Hairdressers, barbers, beauticians	2633	0.11	498	0.04	2.7
Marketing promoters	14274	0.61	2724	0.23	2.7
Debt collectors	571	0.02	114	0.01	2.6
Other occupations in transport	3239	0.14	668	0.06	2.5
Technical nursing assistants	280	0.01	60	0.01	2.4
Catering supervisors	6398	0.27	1373	0.11	2.4
Pre-primary teachers	2243	0.10	491	0.04	2.3
Chemists, physicists	7233	0.31	1644	0.14	2.3
Authors	668	0.03	159	0.01	2.2
Other housekeeping service work	231	0.01	56	0.00	2.1
FEMALES	**Sweden**	**%**	**Finland**	**%**	**S%/F%**
Prison guards	4384	0.20	207	0.02	11.1
Messengers, delivery boys	2890	0.13	151	0.01	10.1
Railway engine drivers	336	0.02	30	0.00	5.9
Auditors	5560	0.26	498	0.04	5.9
Prosecutors and senior police officials	477	0.02	45	0.00	5.6
Military officers	537	0.02	51	0.00	5.5
Economists, statisticians	14567	0.68	1617	0.14	4.7
Occupation not specified	188103	8.72	23700	2.09	4.2
Railway and station personnel	1335	0.06	177	0.02	4.0
Domestic helps	100491	4.66	13381	1.18	3.9
Cashiers in shops and restaurants	21176	0.98	2845	0.25	3.9
Airline pilots	71	0.00	10	0.00	3.7
Policemen	2506	0.12	421	0.04	3.1
Assistant nurses and receptionists	202749	9.40	39470	3.48	2.7
Wholesalers	1256	0.06	247	0.02	2.7
Pre-primary teachers	48800	2.26	10988	0.97	2.3
Iron and metalware work	29313	1.36	6933	0.61	2.2
Pursers and hostesses	6523	0.30	1611	0.14	2.1
Child care in families	101447	4.70	25740	2.27	2.1
Other health care occupations	2473	0.11	634	0.06	2.1

Table 7. Relatively large occupational groups in Finland compared to Sweden

MALES	Sweden	%	Finland	%	F%/S%
Other juridical occupations	123	0.01	907	0.08	14.4
Draftsmen and survey assistants	462	0.02	2420	0.20	10.2
Research and consulting in forestry	1432	0.06	4088	0.34	5.6
Hotel receptionists	727	0.03	1802	0.15	4.8
Farmers, silvic- and horticulturists	52318	2.24	85863	7.18	3.2
Customs officers and border guards	1959	0.08	2972	0.25	3.0
Other religious work	691	0.03	1046	0.09	3.0
Other sales personnel	3415	0.15	4445	0.37	2.5
Telephone operators	372	0.02	481	0.04	2.5
Research and consulting in agriculture	2078	0.09	2584	0.22	2.4
Harbour masters	599	0.03	738	0.06	2.4
Educational consulting	2895	0.12	3531	0.30	2.4
Telecommunication operators	687	0.03	826	0.07	2.3
Other artistic and literary occupations	2109	0.09	2522	0.21	2.3
Livestock breeders	4438	0.19	4963	0.42	2.2
Other business managers	29461	1.26	32607	2.73	2.2
FEMALES	**Sweden**	**%**	**Finland**	**%**	**F%/S%**
Research and consulting in forestry	81	0.00	574	0.05	13.5
Farmers, silvic- and horticulturists	17841	0.83	70759	6.24	7.5
Shoe and leather work	989	0.05	2709	0.24	5.2
Other building and construction work	511	0.02	1396	0.12	5.2
Firemen	24	0.00	55	0.00	4.4
Telecommunication operators	1243	0.06	2790	0.25	4.3
Other juridical occupations	133	0.01	285	0.03	4.1
Research and consulting in agriculture	1177	0.05	2375	0.21	3.8
Other sales personnel	2316	0.11	4527	0.40	3.7
Building caretakers	3467	0.16	6345	0.56	3.5
Debt collectors	427	0.02	695	0.06	3.1
Bath attendants	893	0.04	1351	0.12	2.9
Ship's masters, mates and pilots	12	0.00	18	0.00	2.9
Pharmacy work	4851	0.22	7169	0.63	2.8
Bank clerks	24127	1.12	34942	3.08	2.8
Deck and engine room crew	217	0.01	309	0.03	2.7
Cutting and sewing work	15057	0.70	21137	1.86	2.7
Harbour masters	30	0.00	38	0.00	2.4
Construction engineers, architects	4808	0.22	6030	0.53	2.4
Textile work	3727	0.17	4669	0.41	2.4
Social workers	41305	1.91	50737	4.47	2.3
Insurance salesmen	761	0.04	928	0.08	2.3
Cost accountants	1580	0.07	1758	0.15	2.1
Agri- and horticultural workers	9850	0.46	10948	0.97	2.1
Farm supervisors	507	0.02	563	0.05	2.1
General business managers	2352	0.11	2607	0.23	2.1
Other artistic and literary occupations	1509	0.07	1614	0.14	2.0
Bus and tram conductors	374	0.02	396	0.03	2.0

Another interesting observation is that the number of those whose occupation is unknown is considerably larger in Sweden than in Finland. The size of the group 'unknown' is also different in the two countries according to education and it is excluded from the subsequent analysis. The following table shows the shares of the 'unknown' group by sex, age and education. Younger persons have the highest share of unknown occupation. Then, after the age of 49, the number of unknown cases grows again. Information on occupation is lacking from males slightly more often than from females.

Table 8. Persons whose occupation is unknown in 1990 by sex, age and education

		Sweden		Finland	
Sex	**Age**	**Educated**	**No education**	**Educated**	**No education**
Male	< 30	11.2	27.4	4.5	6.0
	30-39	6.8	10.3	0.9	1.3
	40-49	5.1	6.6	0.8	1.1
	> 49	7.7	13.7	1.6	2.0
	ALL	**7.9**	**13.8**	**2.0**	**2.3**
Female	< 30	10.8	31.5	4.1	5.8
	30-39	5.6	9.8	1.1	1.6
	40-49	3.8	5.5	0.8	1.1
	> 49	5.4	10.6	1.4	2.0
	ALL	**6.7**	**13.4**	**1.9**	**2.2**

Note: No education means no education after basic level or education unknown, see appendix A.

According to Statistics Sweden, the large proportion of missing data on occupation among those employed according to the 1990 census is due to the fact that data on employment and data on occupation were collected in different ways, using different sources. Information on occupation was collected on the census forms that were sent out to all households. Only those who considered themselves employed in November 1990 were asked to fill in their occupation. Information on employment, however, has since 1985 been taken from administrative registers (from the tax system). However, this information is sometimes of poor quality. The result of this procedure in the 1990 census was that a considerable number of persons were classified as employed, although they did not consider themselves employed in November 1990, and, consequently did not fill in their occupation (if they had one) on the census form.

In the 1980 census data on occupation as well as on employment were collected on the census forms, and only those who considered themselves employed were asked to fill in their occupation. This explains why the proportion of missing information on occupation is much smaller in the 1980 census.

The following figures show that the share of those whose occupation remains unknown also varies considerably also in different educational groups in Sweden and Finland. The groups with high shares in the male profile in Sweden include, for instance, law, engineering programmes and secondary social and maritime programmes. Except for law, these educational groups also appear in the female figure along with some secondary technology programmes.

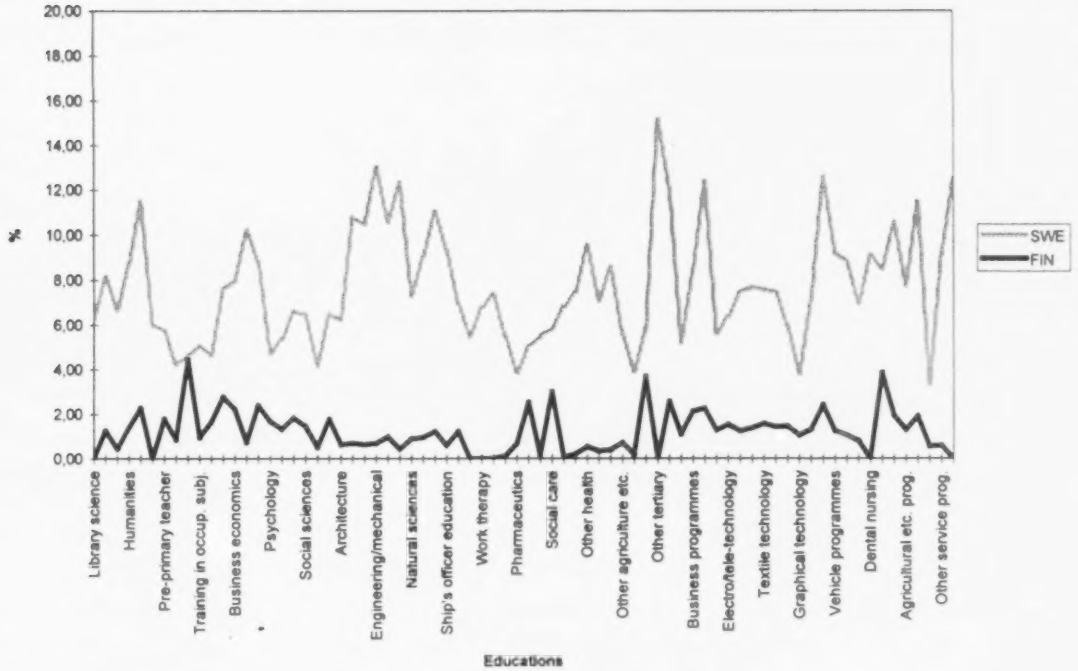


Fig. 2. Occupation unknown by educational group, males

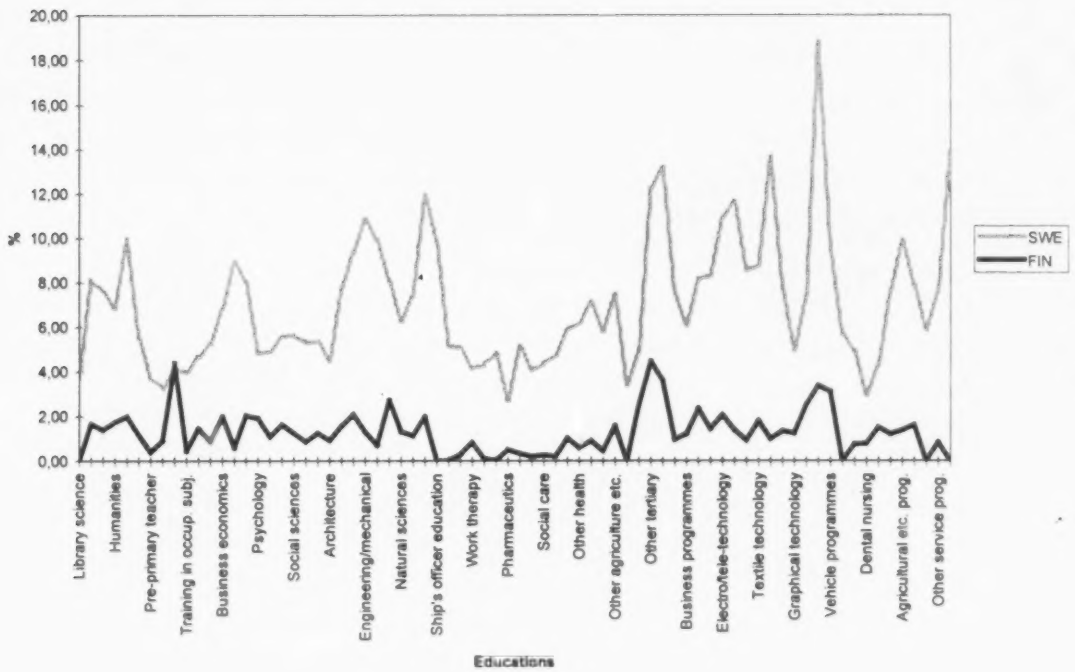


Fig. 3. Occupation unknown by educational group, females

BEST COPY AVAILABLE

Occupational profiles in tertiary education

In the field of tertiary education, similarity indexes tend to be quite high (similarity and domain indexes[4] for all educational groups are listed in appendix C). Thus, occupational profiles in Sweden and Finland are basically quite similar. In addition, high similarity indexes are partly a result of the large number of occupational groups which requires a closer analysis of the main occupational profiles (see discussion below). There are also very low similarity indexes which also deserve a closer look. Similarities between the miscellaneous groups are relatively rare as expected but these groups are not of interest to this analysis.

Another general observation is that in most of the educational groups occupational domains tend to be wider in Sweden than in Finland. Compared to the 1980 data this is a clear change. This is probably at least partly due to the problem in the Swedish 1990 data which was discussed above in connection with the relatively large number of cases where occupation is unknown.

In this part, only some of the main differences are studied in order to detect further problems in the classificational structures as well as to give some broad characterisations of the occupational profiles in different fields of tertiary education. Another objective is to analyse the basic structures of the academic labour market which are quite similar in both countries.

Arts and humanities

Education in the field of arts and humanities was divided into four main subgroups. Library science and theology have relatively narrow occupational profiles compared to fine and applied arts and humanities. Similarity indexes are high indicating similar occupational profiles between the two countries. The fifth subgroup combines miscellaneous educational programmes which have more varied profiles.

Before looking closer at the humanities programmes where the difference in the domains is notable for both males and females, we can note the lower similarity index of female theologists, 0.78 compared to almost one for males (see Table 9). This relates to the different historical situation of female theologists in Sweden and Finland, where priesthood was opened to females relatively late. It follows that in Sweden 65% of female theologists are working as priests compared to 41% in Finland. In Finland 38% of female theologists have found employment in primary and secondary teaching.

[4] For further information on these indexes, see appendix C and Borghans, Hughes & Smits 1998.

Table 9. Similarity and domain indexes in arts and humanities

Arts and humanities	Similarity index		Occupational domain index			
	Male	Female	Swe-male	Fin-male	Swe-female	Fin-female
Library science	1.00	1.00	1.61	1.54	1.26	1.39
Fine and applied arts	0.90	0.90	9.85	8.88	10.39	10.23
Theology	1.00	0.78	1.64	1.66	2.30	3.15
Humanities	0.90	0.84	11.89	4.52	10.70	3.16
Other arts and hum. prog.	0.65	0.52	39.72	5.99	15.30	3.93

The following figures show the main occupational profiles[5] of higher education graduates in the field of humanities. High similarity indexes (0.90 for males and 0.84 for females) indicate similar occupational structures. However, in Sweden humanists are more often employed outside the main occupations, as we can see from the figures. For instance, 36% of Swedish male humanists are working in other than the main occupations compared to only 17% in Finland.

As mentioned above, due to the large number of occupational groups, similarity indexes tend to be quite high, even if differences in the main occupational groups are relatively large. For instance, in the case of female humanists (Figure 5) the similarity index across the nine groups (eight main groups and the group 'other occupations') is 0.75.

The main difference between Sweden and Finland seems to be that in Finland education in the humanities leads to teaching jobs. Of females, over a half and of males two out of five work as primary and secondary school teachers compared to only one fifth in Sweden. University and higher education teachers take second place for males employing slightly over 10%. Clearly, women are not employed in higher education teaching as often. Instead, female humanists tend to end up in clerical work.

[5] In the following analysis main occupational profiles are defined as a composition of those occupations employing at least 3% of those with the education in question in either country. In the figures, occupational groups are classified according to the Swedish case.

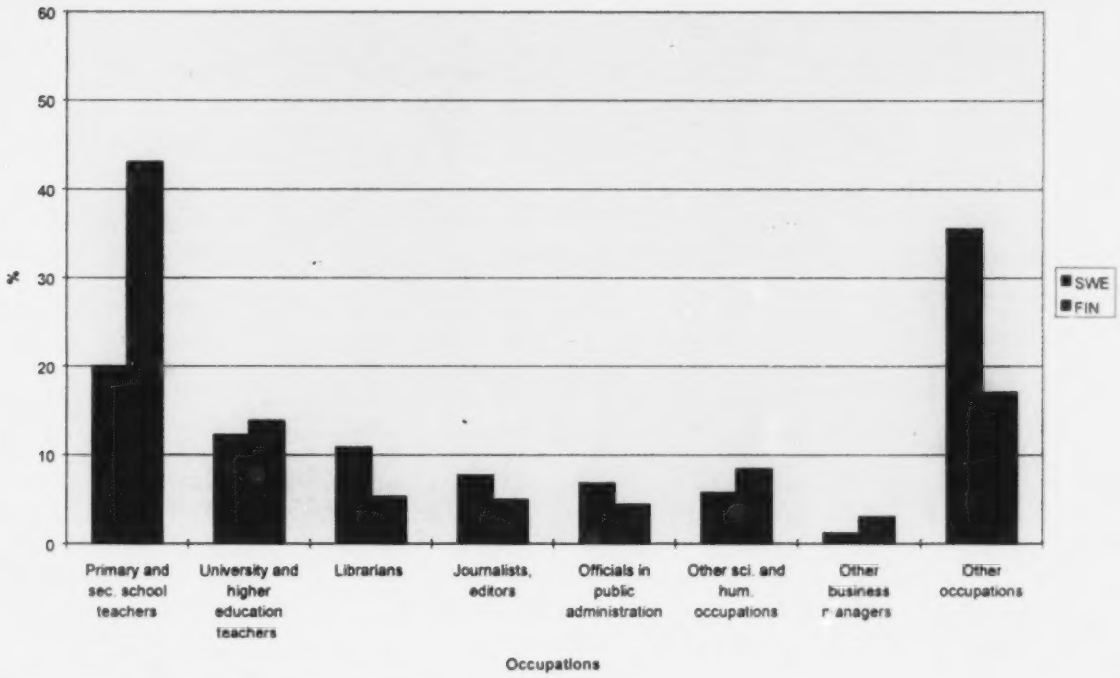


Fig. 4. Occupational profiles of male humanists

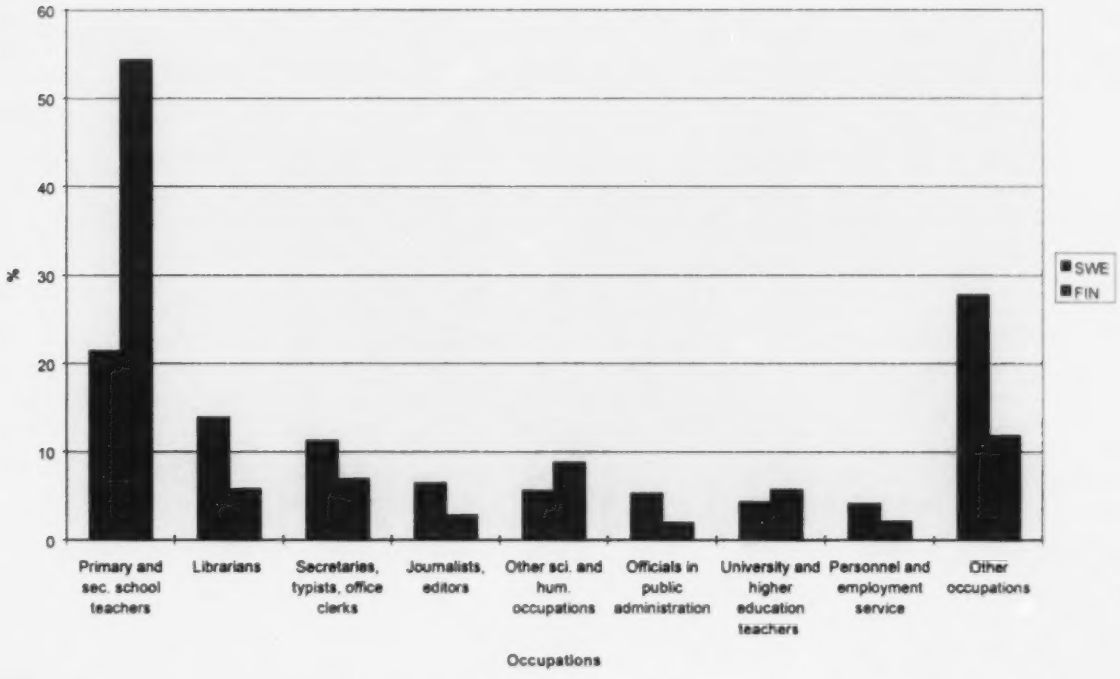


Fig. 5. Occupational profiles of female humanists

BEST COPY AVAILABLE

Teacher training

Teacher labour markets are highly professionalised in both Sweden and Finland. Teachers have a relatively strong labour market position and also some control over the supply side. This is indicated in the narrow domains and also by the high similarity between the countries. For instance, in both countries 90% of females trained as primary teachers also work in the group 'primary or secondary teachers'. There are only a few differences between female and male occupations, except in the field of leisure-time instruction which is a small educational group in Finland (57 males and 171 females with known occupation).

Table 10. Similarity and domain indexes in teacher training

Teacher training	Similarity index		Occupational domain index			
	Male	Female	Swe-male	Fin-male	Swe-female	Fin-female
Leisure-time instruction	0.76	0.81	3.94	5.10	2.29	4.40
Pre-primary teacher training	0.99	1.00	2.83	1.99	1.46	1.51
Primary teacher training	1.00	1.00	1.39	1.28	1.24	1.23
Subject teacher training	1.00	1.00	1.45	1.67	1.28	1.51
Training in occup. subj.	1.00	0.95	1.81	1.52	3.21	1.27
Training in aesthetics subj.	0.99	0.99	1.76	2.16	1.61	2.44
Other teacher training	0.80	0.96	4.43	7.97	4.15	5.81

Social and behavioural sciences

Social and behavioural sciences include very different educational groups. Law represents a traditional academic discipline with a high professional status. Education in the field of social work is a later invention connected to the development of the welfare state.

We can see from the Table 11 that education in study and labour market guidance has very low similarity between Sweden and Finland. There is a close match between education and occupation but in Sweden SLM-instructors are classified in 'other occupations in education' whereas in Finland, they are grouped with primary and secondary teachers. In Finland 96% of females having this education were employed in the teacher group. In Sweden 69% worked in 'other occupations in education' and 5% in the teacher group. In the field of education for social work, on the other hand, there are probably more differences also in the curriculum level. In Finland there is an administrative

emphasis which is evident in male profiles (similarity 0.69). In Finland 38% of males work in public administration and 13% in business management compared to 20% and 2% in Sweden.

Table 11. Similarity and domain indexes in social and behavioural sciences

Social and behavioural sciences	Similarity index		Occupational domain index			
	Male	Female	Swe-male	Fin-male	Swe-female	Fin-female
Business economics	0.59	0.52	9.82	5.45	8.49	8.38
Law	0.96	0.98	8.15	7.49	8.05	5.00
Journalism	0.98	0.99	1.71	2.05	1.67	1.82
Psychology	0.98	1.00	2.19	2.60	1.71	1.56
Social work	0.69	0.96	4.12	5.43	1.98	4.12
ADP	0.99	0.98	2.89	1.34	3.30	1.35
Social sciences	0.85	0.66	14.33	11.67	13.65	10.22
Study and LM guidance	0.19	0.08	2.43	1.16	2.06	1.08
Other SB-programmes	0.39	0.88	19.61	8.60	10.40	4.46

Two groups will be studied closer at this point, business economics and social sciences. In business economics similarity indexes are low for both males and females and males have also different occupational domains in the two countries. In the case of social sciences, the female similarity index is only 0.66 indicating different occupational destinations.

The following figures show the main occupational destinations of graduates in business economics. The main difference between the countries is that in Sweden the largest group is economists and statisticians, whereas in Finland, most business economists are occupied in the group 'other business managers'. This can be partly explained by the relative sizes of these groups which indicate a differing volume of demand in the labour market. In Sweden the group 'economists and statisticians' employ 0.8 cent of the male labour force and 0.7% of the female labour force. In Finland the respective percentages are 0.2 and 0.1. 'Other business managers' employ 1.4% of males and 1.1% of females in Sweden. In Finland this group employs 2.8 and 0.9% respectively.

If we look at the further differences between male and female labour markets, we can note that the male profile includes general business managers whereas the female profile, especially in Finland, includes clerical and teaching occupations. In Sweden both sexes have also found employment as auditors more often than in Finland.

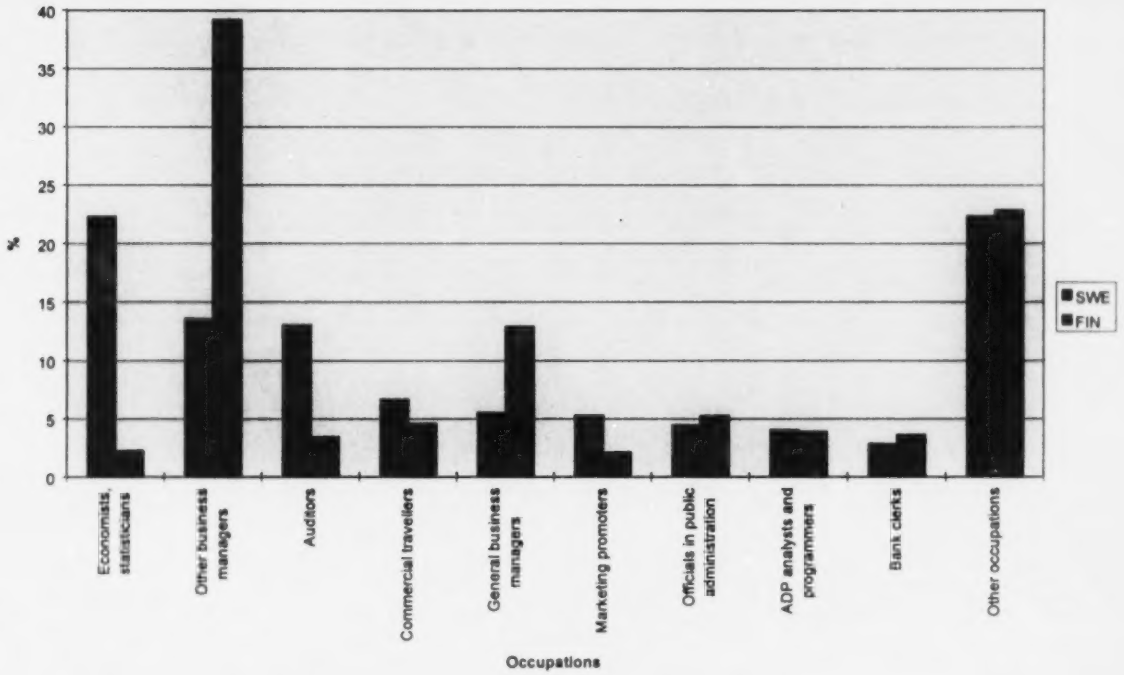


Fig. 6. Occupational profiles of business economics, males

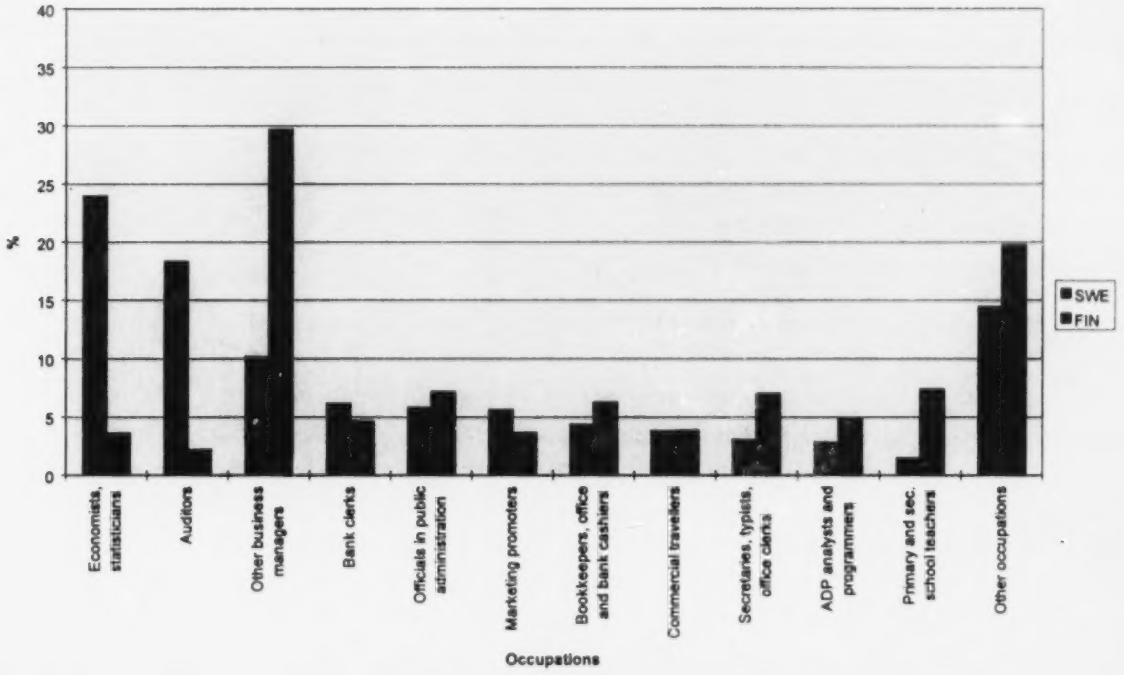


Fig. 7. Occupational profiles of business economics, females

Social sciences have relatively wide occupational profiles. Domain indexes vary from 10.2 (females in Finland) to 14.3 (Swedish males). Social sciences compound quite different educational programmes in both countries which probably explains part of the profile

variations. As we can see from the following figures, the basic structure of social science labour markets include work in public and business administration, teaching and research jobs and professional occupations, such as psychologists, for instance.

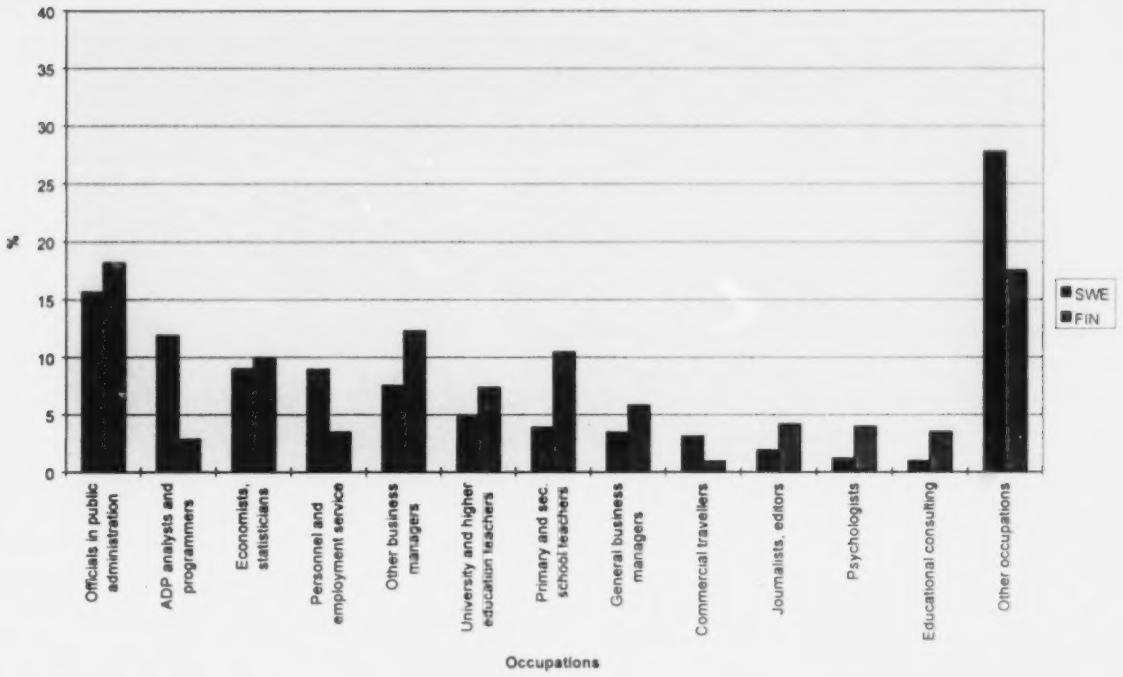


Fig. 8. Occupational profiles of social sciences, males

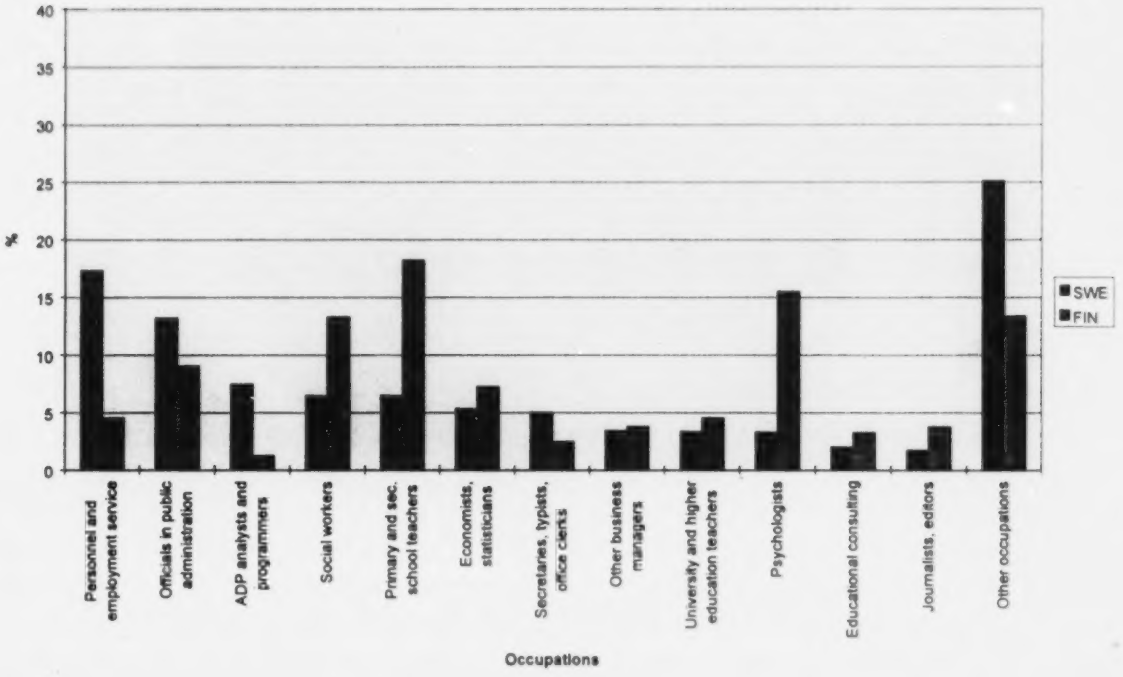


Fig. 9. Occupational profiles of social sciences, females

Psychologists have nowadays also their 'own' educational programme but it is relatively small in both countries. For instance, in Finland, there are 1516 female social scientists working in their professional occupation and, thus, probably graduated from psychology compared to only 245 having the new type of psychology education.

As in the field of humanities, the occupational 'tail' is much longer in Sweden than in Finland. Of male social scientists in Sweden 28% work in miscellaneous occupations compared to 18% in Finland. Female percentages are 25 and 13 respectively.

Engineering and natural sciences

Engineering programmes in both countries lead basically to similar engineering and technical occupations. However, in Finland, engineers are also typically employed in business management. For instance, in the field of chemical engineering where the male similarity index is relatively low (0.78), 26% work in business management (general and other business managers). In mechanical engineering, where the female similarity index is low (0.70), only 13% work in mechanical engineering occupations, whereas in Sweden, the share is 28%. In Finland, 20% of females graduating from mechanical engineering are employed in the group 'other engineering work' which covers only 3.6% in Sweden.

Table 12. Similarity and domain indexes in engineering and natural sciences

Engineering and natural sciences	Similarity index		Occupational domain index			
	Male	Female	Swe-male	Fin-male	Swe-female	Fin-female
Architecture	1.00	1.00	1.45	1.30	1.49	1.26
Engineering/construction	0.95	0.93	4.02	4.45	5.50	4.74
Engineering/electro-tele	0.94	0.93	4.50	6.13	4.69	5.66
Engineering/mechanical	0.90	0.70	6.13	6.33	7.45	10.11
Engineering/chemical	0.78	0.87	10.49	7.93	6.71	8.34
Other engineering	0.79	0.54	12.39	11.05	11.02	10.45
Natural sciences	0.86	0.72	11.94	7.76	12.63	5.30
Polytechnical programmes	0.87	0.73	12.02	7.26	21.74	5.96
Other technical education	0.15	0.16	13.17	4.51	19.67	3.24

Figures 10 and 11 show the main profiles of natural sciences. We can see the same basic difference as in the field of humanities education. In Finland natural scientists work typically as secondary school teachers. The difference is notable especially in the female labour market. Almost two out of five female natural scientists in Finland have found employment in secondary school teaching compared to less than 10% in Sweden. The

other main groups are quite equally divided including teachers in higher education, chemists and physicists and ADP analysts and programmers. And again, other occupations add up to a larger group in Sweden than in Finland.

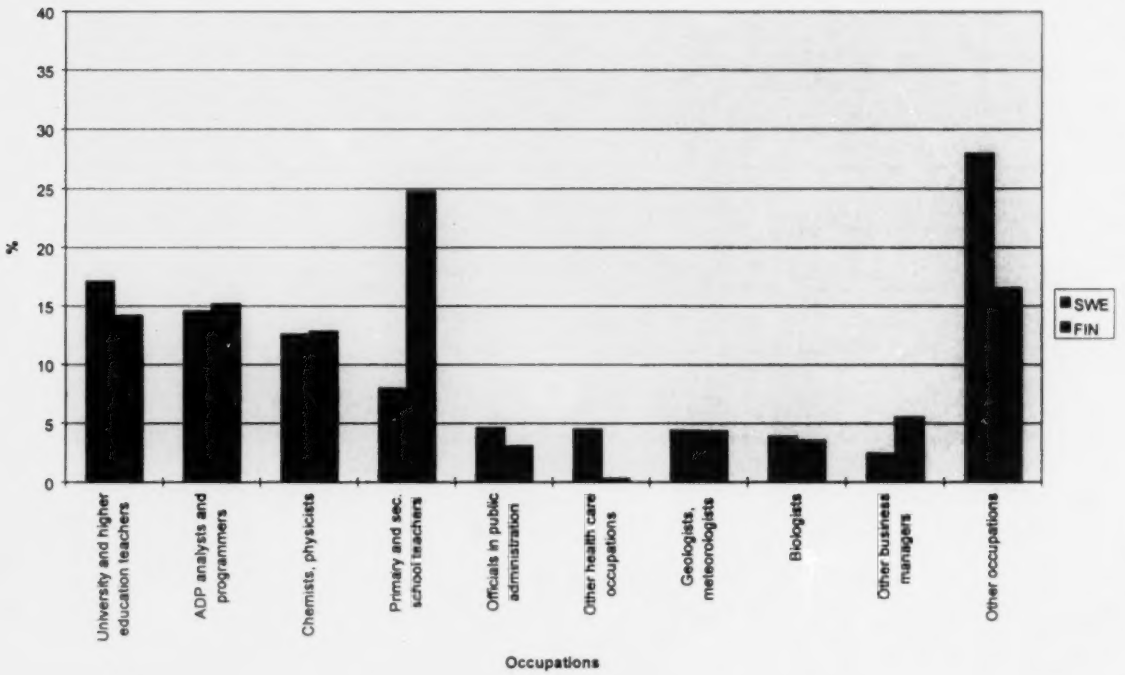


Fig. 10. Occupational profiles of natural sciences, males

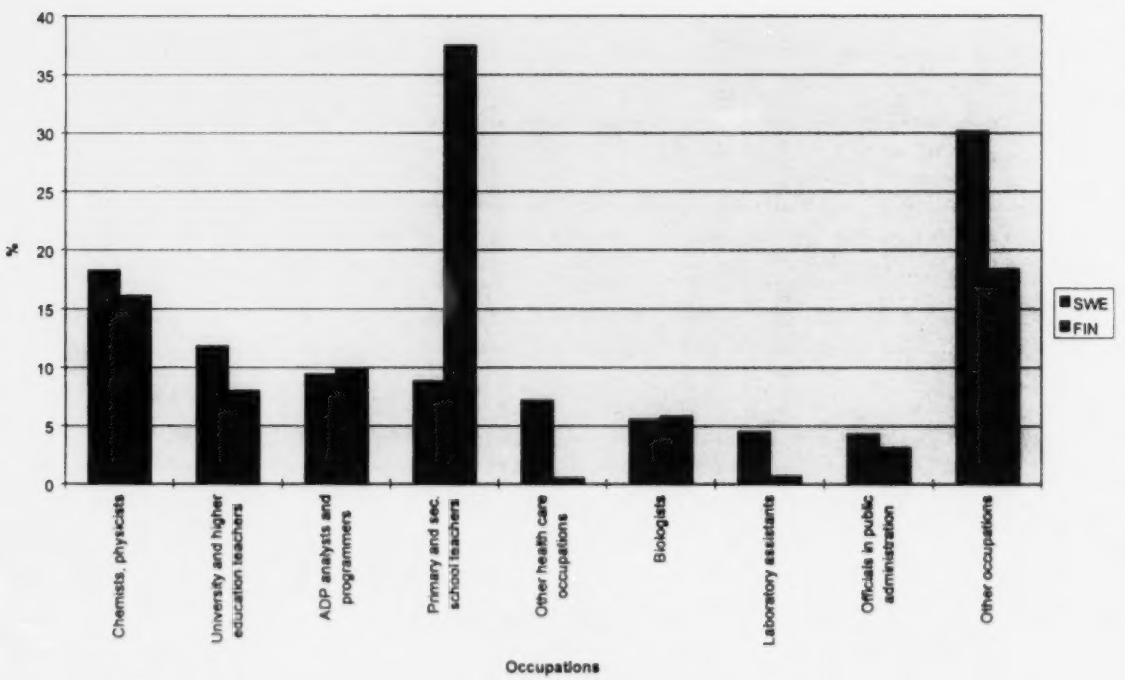


Fig. 11. Occupational profiles of natural sciences, females

Medical and health care education

In the field of medical and health education differences in both educational programmes and labour markets are small. In both countries nearly all graduates of medicine work as physicians. In Finland 8% of males are employed in higher education teaching whereas in Sweden the percentage is only 4. The respective shares for females are 2.8% and 2.3%.

Table 13. Similarity and domain indexes in medical and health education

Medical and health education	Similarity index		Occupational domain index			
	Male	**Female**	**Swe-male**	**Fin-male**	**Swe-female**	**Fin-female**
Pharmacology	0.93	0.95	3.83	1.41	2.85	1.30
Work therapy	0.95	1.00	1.55	1.60	1.28	1.28
Laboratory nursing	0.08	0.10	2.88	1.31	1.52	1.29
Medicine	1.00	1.00	1.18	1.23	1.15	1.09
Pharmaceutics	0.98	1.00	3.10	3.11	1.43	1.29
Physiotherapy	0.95	0.96	2.15	1.36	1.37	1.82
Basic nursing	0.99	1.00	2.03	1.48	1.37	1.22
Social care	0.65	0.10	4.39	4.28	2.16	1.67
Dental nursing	..	1.00	1.28	..	1.12	1.00
Dentistry	1.00	1.00	1.16	1.19	1.14	1.09
Veterinary medicine	1.00	1.00	1.56	1.33	1.28	1.32

Two educational groups have exceptionally low similarity indexes which is due to differences in both educational structures and classifications (see Table 13). The following figure exemplifies the situation of females in the field of laboratory nursing. In Sweden most graduates in laboratory nursing work in the group 'laboratory assistants' whereas in Finland they are classified with the 'nurses' group. In Finland 46% of laboratory assistants have secondary education in chemical technology and 6.5% have secondary training in nursing. In Sweden, where 80% of females having education in laboratory nursing work as laboratory assistants, 56% of laboratory assistants have laboratory nursing education. Thus, there is probably a different emphasis in the curricular content.

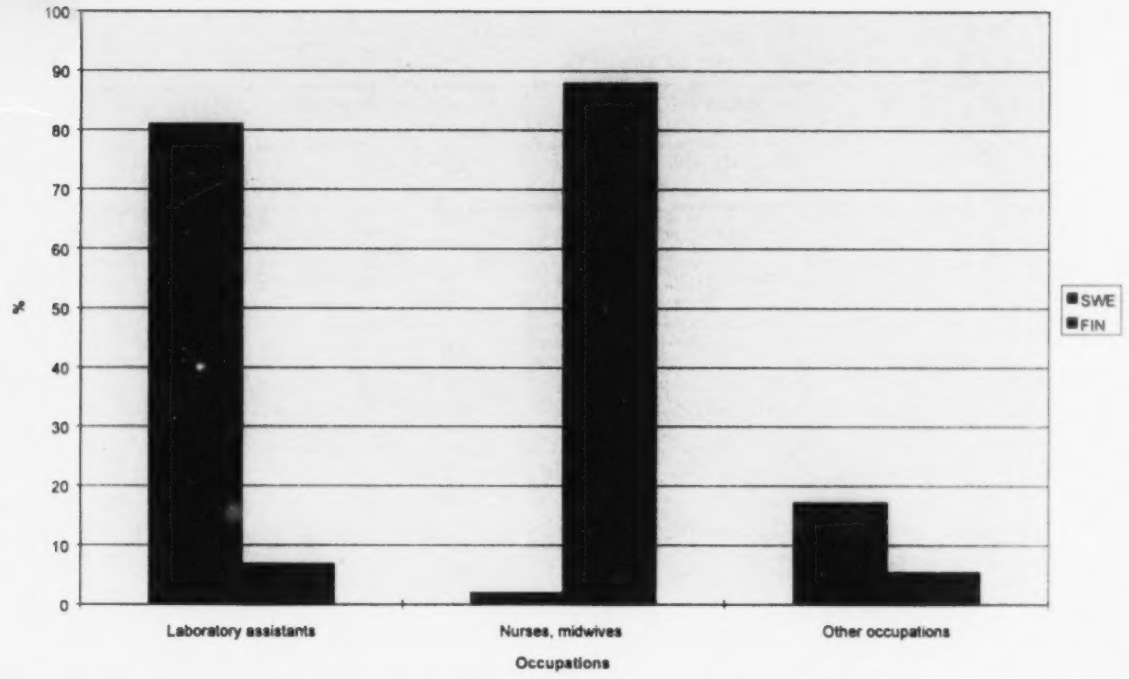


Fig. 12. Occupational profiles of laboratory nursing, females

A similar situation prevails in social care education where the female similarity index is only 0.1. In Sweden this line of training leads to occupations in the group 'social workers' (67%), whereas in Finland, 77% of females having social care education work in nursing occupations and only 7% in social work.

Other tertiary education

Table 14 lists occupational domains and similarities within the rest of the tertiary educational groups. The number of females having a ship's officer education or police or military education is very small yielding unreliable indexes. For males police and military education give relatively similar occupational destinations but in ship's officer education there are differences. The similarity index is 0.87 and occupational domain is 7.45 in Sweden compared to 1.59 in Finland.

In Finland the programme is more clearly destined to ship's captain positions (in Finland 79% and in Sweden 32%) whereas in Sweden this training leads also to other maritime occupations and to engineering.

Table 14. Similarity and domain indexes in the fields of transport, agriculture and forestry and services

Transport, agriculture and forestry, services	Similarity index		Occupational domain index			
	Male	Female	Swe-male	Fin-male	Swe-female	Fin-female
Ship's officer education	0.87	0.35	7.45	1.59	14.93	3.08
Other transport prog.	0.62	0.01	11.80	1.16	12.30	1.22
Agriculture programmes	0.86	0.78	9.17	5.73	4.67	5.25
Forestry programmes	0.74	0.88	7.30	2.62	7.17	4.52
Other agriculture etc. prog.	0.78	0.82	7.27	7.70	10.19	10.82
Police education	1.00	0.25	1.29	1.40	1.43	3.86
Military education	1.00	..	1.91	1.34	2.09	..
Other service education	0.16	0.53	9.55	6.83	4.60	8.68
Other tertiary programmes	0.76	0.82	31.48	11.00	18.39	4.88

The occupational destinations of agricultural programmes are studied closer in the following figures (13 and 14).

The main difference seems to be that in Finland, where there is still a relatively large group of farmers (including silvi- and horticulturists), accounting for 7.3% from employed males (2.5% in Sweden) and 6.4% from employed females (0.9% in Sweden), graduates from agricultural programmes end up working as farmers. The farmer group occupies about 25% of both males and females.

In both countries, the major occupational groups include research and consulting work in the field of agriculture. In addition, females in Finland seem to take more teaching jobs compared to Sweden. Finnish men, on the other hand, are relatively often occupied in private business management compared to Sweden.

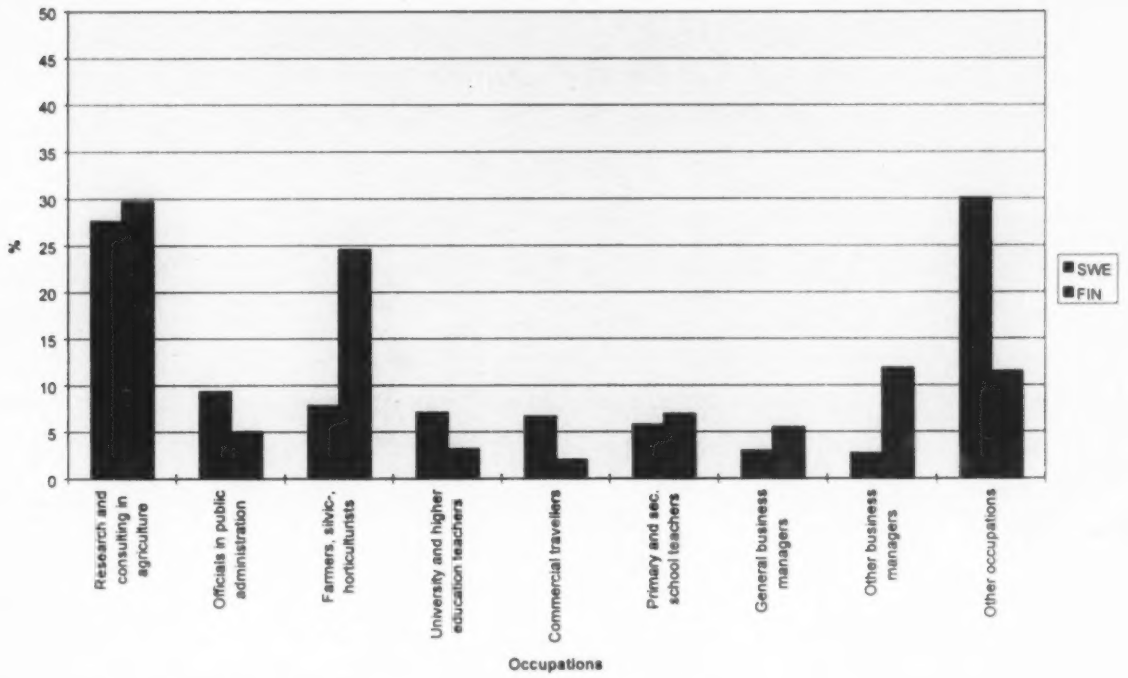


Fig. 13. Occupational profiles of agricultural programmes, males

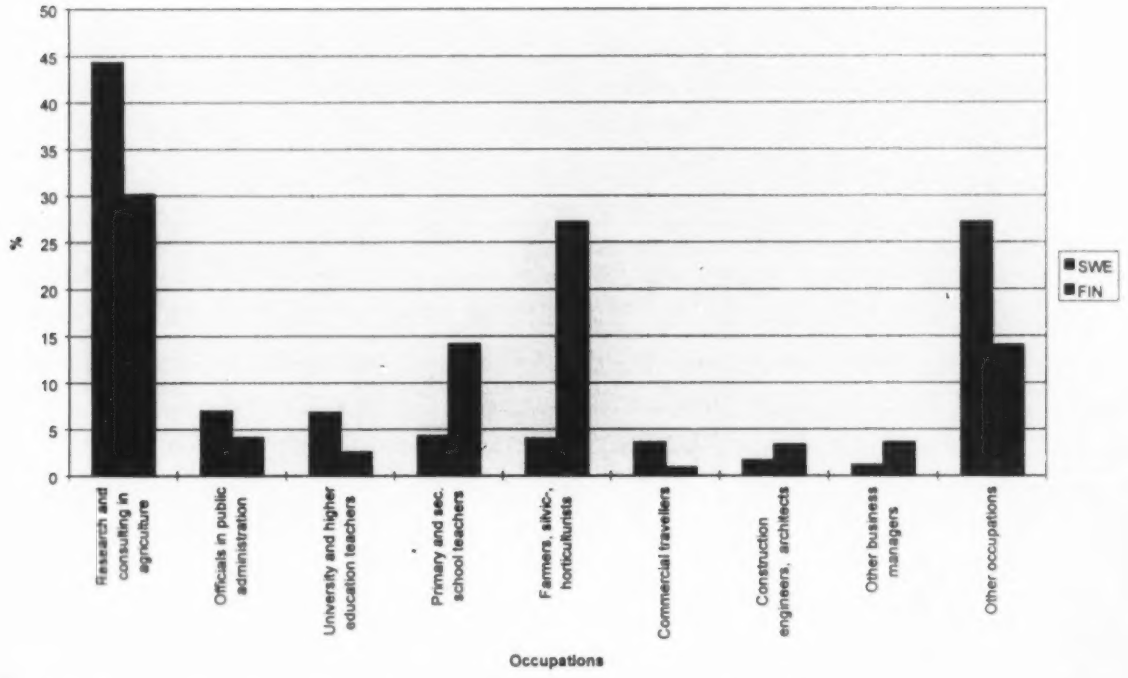


Fig. 14. Occupational profiles of agricultural programmes, females

BEST COPY AVAILABLE

The 'tail' difference between the countries is relatively large especially in the men's occupational profile. If we take a closer look at the 'tail' occupations we can see that the 1-3% marginal includes the following occupational groups in Sweden: chemists and physicists, economists and statisticians, farm supervisors, marketing promoters, personnel and employment services, agricultural workers and construction engineers. In the Finnish profile only agricultural workers qualify for the list. Using 1% as a profile criterion level reduces the tails to 17% in Sweden and 8% in Finland, thus also reducing the difference.

Concluding remarks on tertiary profiles

In the field of higher education and the related professional occupations, there is a close match between education and occupation, and the occupational profiles are basically very similar in Sweden and Finland. However, certain clear differences are also evident. For instance, university education in the fields of humanities and natural sciences in Finland has a clearer emphasis towards basic and secondary teaching jobs than in Sweden. On the other hand, certain fields of study are obviously designed differently in relation to the labour markets. There seems to be, for instance, some overlap and exchange between the semi-professional fields of health care and social work and the related educational groups. Some of these variations are also caused by different classification practices. These problems would require further analysis of the curricular contents which is not in the scope of this project. As noted in the introduction, the various professional regulations concerning required competences should also be accounted for.

An interesting phenomenon is the relatively wider domains of most educational groups in Sweden. What does the longer 'tail' of occupations indicate? For instance, are the Swedish tertiary courses in the diversified higher education system also more diverse in nature than in the Finnish unitary system? Or is the Swedish data on persons education/occupation less accurate than the Finnish? It seems a little odd that, for instance, the share of women in Sweden who have a humanities degree and work in engineering or medical occupations is 3.6% compared to only 0.4% in Finland. There are several possible explanations to this. In the Finnish case, a known problem is the miss-synchronisation of the different registers from which the original data emanates.

The following table compares the 1990 occupational domains and 'tail' percentages with the 1980 data in humanities, social sciences and natural sciences, where the 1990 'tail' difference between Sweden and Finland was relatively large (see Figures 4 through 9). We can see that in humanities and natural sciences there has been a clear growth in the Swedish 'tail' percentages. Of male humanists, for instance, 22% were employed in 'miscellaneous occupations' in 1980, whereas in 1990, the percentage was 36, yielding to a corresponding increase in the domain index.

However, there was already in 1980 a clear difference, especially between females, in humanities and social sciences but not in natural sciences. If we look more closely at the 1980 profiles we can see that the differences in humanities and natural sciences in Sweden are mainly due to the changing shares of those working as teachers. The share of teachers has decreased in both countries but much more in Sweden than in Finland. In

addition, if we take into account that the number of those whose occupation is unknown is below the average in the educational fields in question, the conclusion must be that the wider occupational domains in Sweden also show real existing differences in the matching of education and occupations.

Table 15. Domain indexes and 'tail' percentages in humanities, social sciences and natural sciences

			DOM 1980	DOM 1990	TAIL 1980	TAIL 1990
Humanities	SWE	Male	3.9	11.9	21.6	35.5
		Female	3.8	10.7	21.2	27.8
	FIN	Male	3.5	4.5	17.7	17.0
		Female	2.4	3.2	10.2	11.8
Social sciences	SWE	Male	14.6	14.3	26.4	27.8
		Female	14.4	13.7	24.9	25.1
	FIN	Male	11.4	11.7	19.3	17.5
		Female	10.4	10.2	13.6	13.3
Natural sciences	SWE	Male	7.7	11.9	24.2	29.9
		Female	5.7	12.6	22.3	30.2
	FIN	Male	7.6	7.8	22.1	16.5
		Female	3.9	5.3	21.9	18.4

Occupational profiles in secondary education

There seems to be no clear pattern between tertiary and secondary education as far as similarity and domain indexes are concerned (see appendix C). In Sweden, tertiary education as a whole seems to give more occupational options for males than secondary education. In Finland domain indexes are about the same, as is the case for women in Sweden. On the other hand, in Finland, women's secondary domain is much wider than the occupational domain of tertiary education. Men with secondary education have more similar occupational profiles than those who have tertiary degrees. For women, the situation is the opposite.

Secondary business programmes, for instance, lead to more similar occupations than business economics. On the other hand, male domains are wider but female domains are narrower in secondary than in tertiary education. The situation is similar in secondary social studies compared to social sciences, except that the male similarity index is lower in social studies. Also in engineering and technology programmes, if they are taken together, the male similarity index is higher in secondary (0.98) than in tertiary (0.83) education.

The following discussion is divided into three parts. First we consider humanities and social programmes. The second part deals with technical programmes and the third covers the rest of the secondary programmes. Only some of the main differences in the Swedish and Finnish profiles are analysed, in order to give an idea of the scope of the differences which are behind the highly abstract indexes.

Humanities, teacher training and SB-programmes

Table 16 shows that secondary art programmes have relatively wide occupational domains which also differ from each other in Sweden and in Finland. Especially male domains are much wider in Sweden than in Finland. Figure 15 illustrates the occupational profiles of females. It is a good example of a humanities type of education which has a wide occupational domain. In addition to the professional sector (artists, etc.), which employs altogether 26% of women with secondary arts education in Sweden and 12% in Finland, many of them also work in various other occupations which are typical of the female labour market. The Finnish profile includes two occupational groups which also appear in the profiles of other educational programmes, namely social workers and farmers, etc. These are occupational groups which have their own historical dynamics in the absorption of female labour.

Table 16. Similarity and domain indexes in humanities, teacher training and SB-programmes

Secondary	Similarity index		Occupational domain index			
programmes	Male	Female	Swe-male	Fin-male	Swe-female	Fin-female
Arts programmes	0.70	0.70	23.91	15.61	28.67	24.32
Teacher training	0.36	0.35	4.98	8.51	9.94	5.77
Business programmes	0.88	0.98	25.36	17.93	6.68	4.85
Social studies	0.52	0.89	25.28	18.02	8.02	11.48

Male profiles are narrower, especially in Finland. In the Swedish profile, occupations in the field of performing arts are more common than in Finland. The Finnish profile, on the other hand, includes more craft occupations.

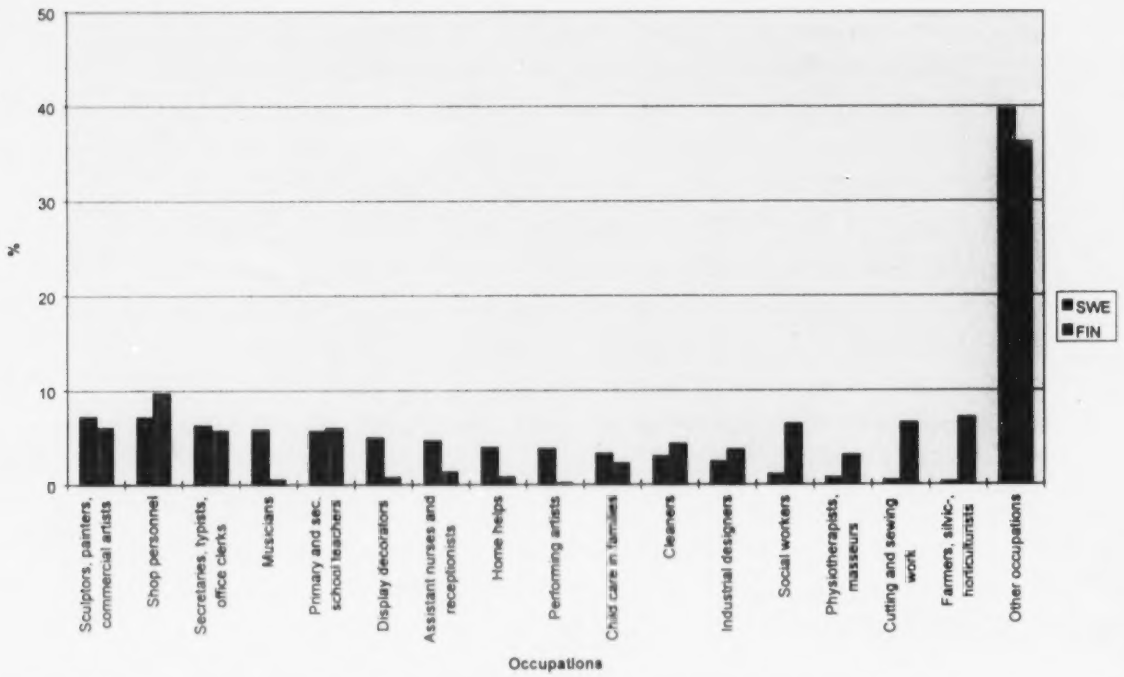


Fig. 15. Occupational profiles of females with secondary arts training

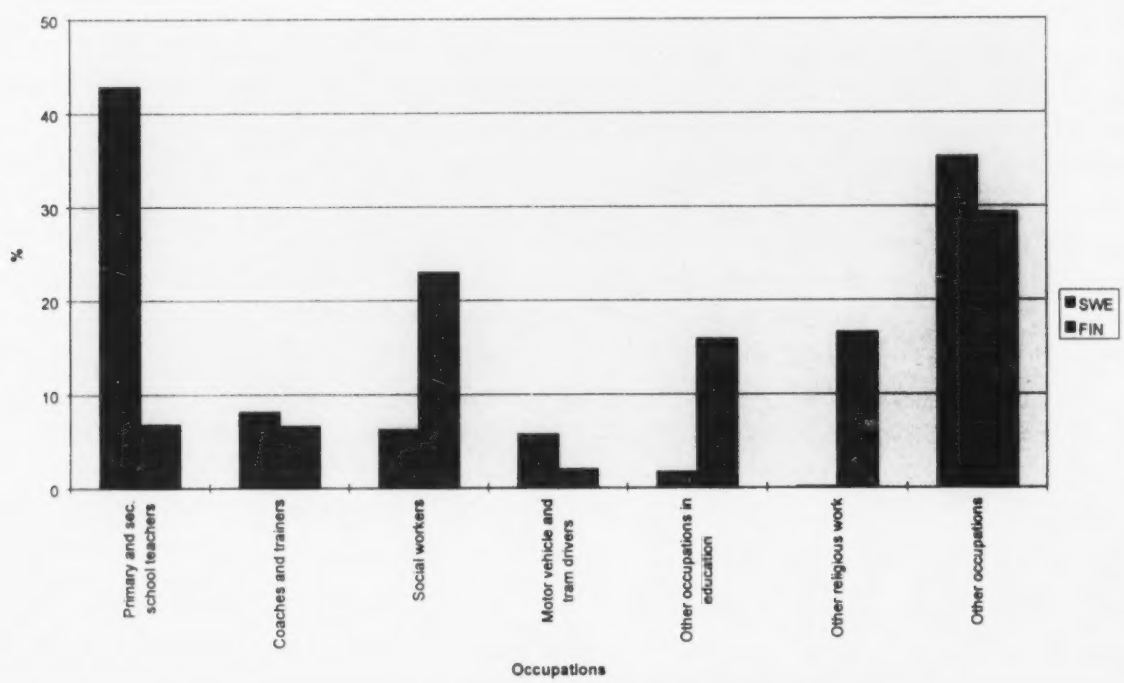


Fig. 16. Occupational profiles of males with secondary teacher training

In the case of teacher training, low similarity indexes are mostly due to different educational contents of the programmes. This is also evident if we look at Figures 16 and 17 which show the main profiles. In Finland, secondary teacher training includes, for instance, courses in youth and social instruction. Consequently, in the Finnish profiles social workers (23% males and 35% females) and the group other religious work (17% males and 18% females) take the largest shares, whereas in Sweden, primary and secondary teachers (43% males and 23% females) is the main occupational group. It seems that males have better chances to get teacher jobs which are mainly occupied by persons with tertiary education.[6] In Sweden women with secondary teacher training work, for instance, as coaches and trainers, or they end up in miscellaneous occupations as we can see from the large tail percentage (43%).

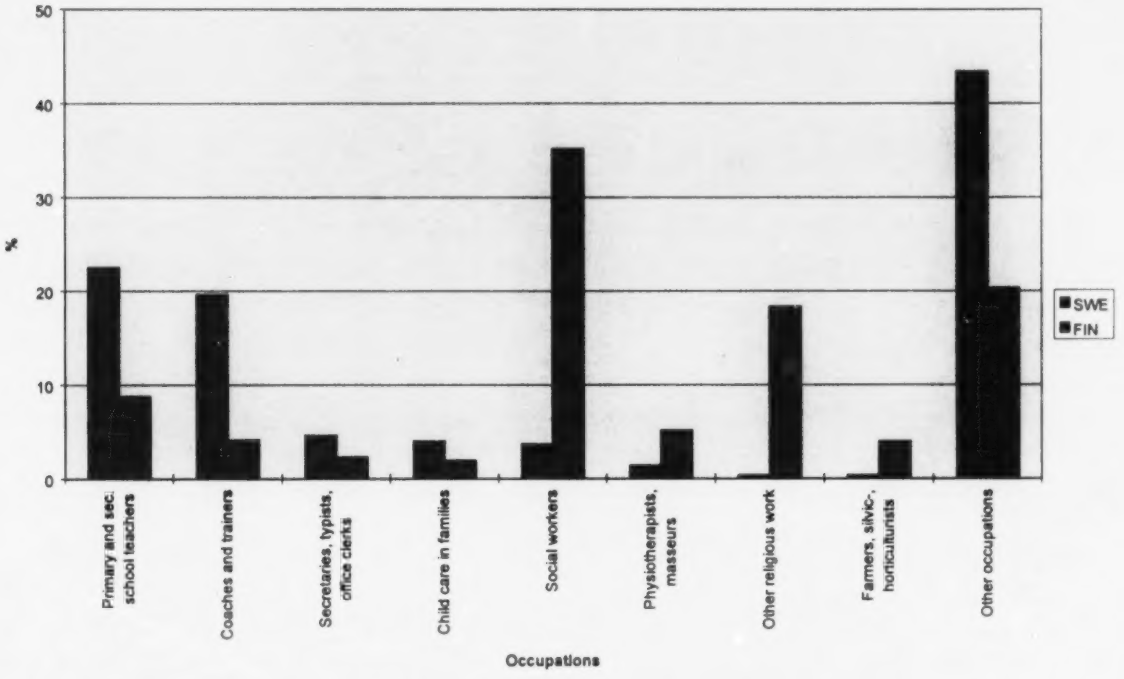


Fig. 17. Occupational profiles of females with secondary teacher training

In the field of secondary social studies, there are fewer similarities between male and female occupational profiles. In Sweden, males have a wider domain, whereas in Finland, the female domain is somewhat wider than in Sweden. The differences between the two countries in the main occupational profiles are shown in Figures 18 and 19. We can see that the profiles include mainly commercial and clerical occupations. Males in Sweden are more often employed, for instance, as commercial travellers (13% v 5%) or bank clerks (7% v 0.1%) compared to Finland. Finnish men, on the other hand, seem to end up more often in manual work. In addition, in Finland both men and women work more often in the field of ADP than in Sweden. 16% of Finnish men are employed in the ADP group

[6] This is a good example of the need to apply the matching framework described at the beginning. If we look at the educational profiles of primary and secondary teachers, we see that in Sweden only 1.1% of men and in Finland only 0.7 percent have secondary teacher training. The respective percentages for women are 0.3 and 0.8.

compared to only 2% in Sweden. The difference between the male and female labour market is similar in both countries: women are far more often employed in the group secretaries, typists and office clerks than men.

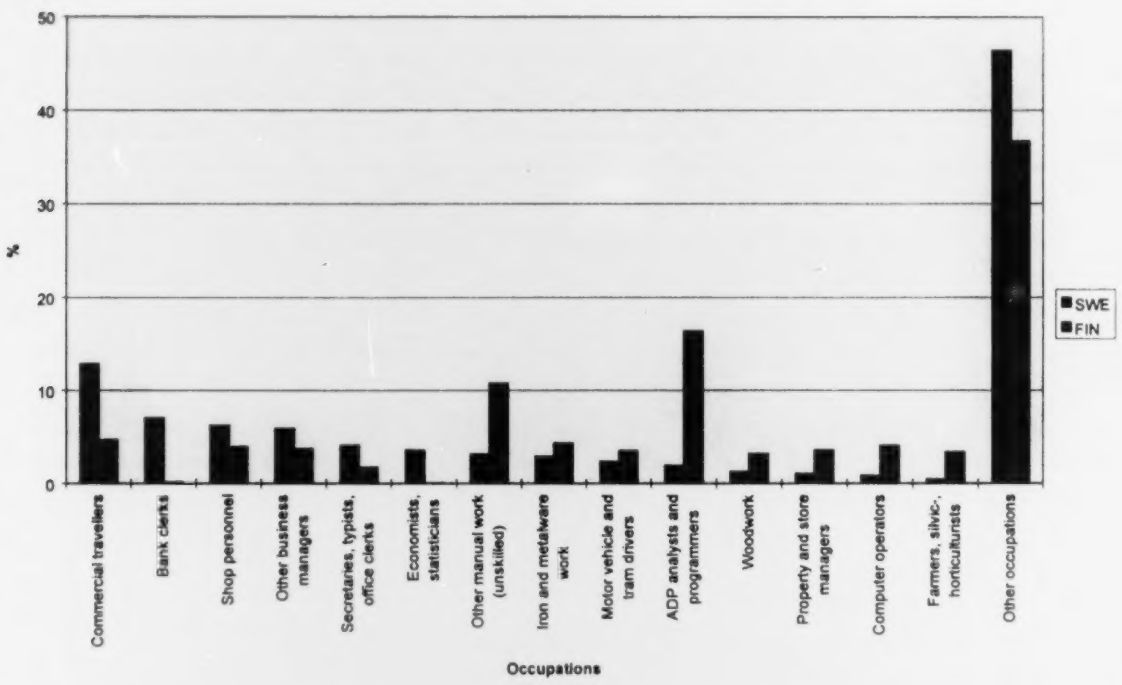


Fig. 18. Occupational profiles of males with secondary social studies

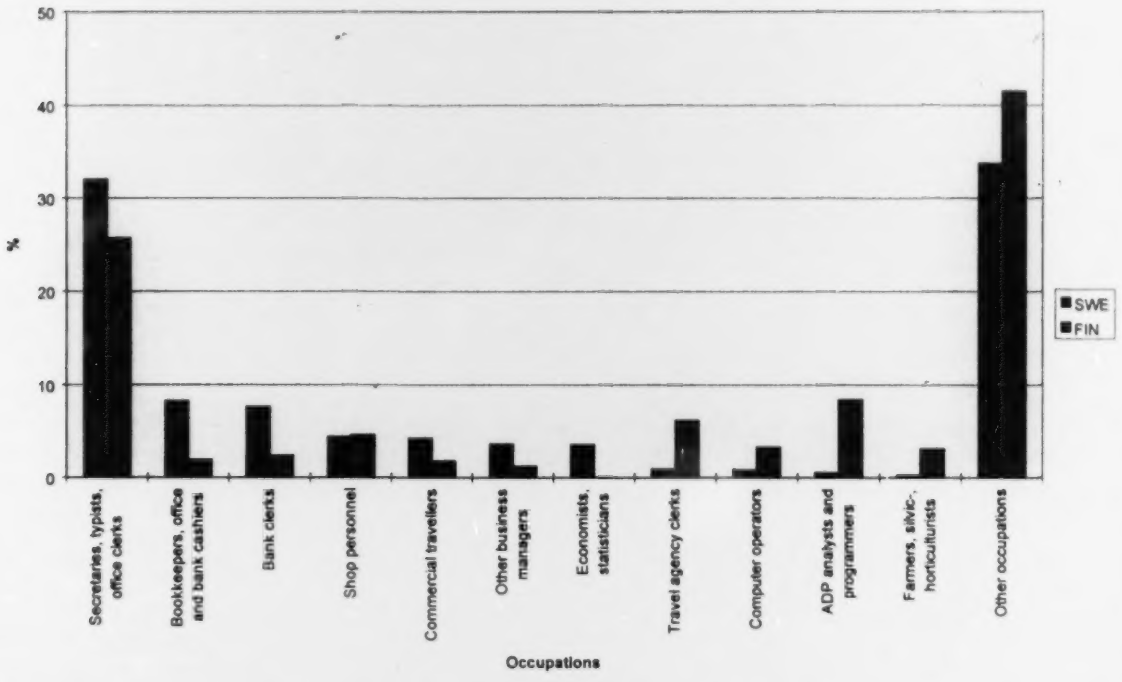


Fig. 19. Occupational profiles of females with secondary social studies

Secondary technology programmes

Table 17 summarises the similarity and domain indexes of secondary technology programmes. Depending on the field, occupational domains tend to be quite different. In textile technology domain indexes vary from 12 to 26, whereas in graphical technology, they are between 2.3 and 3.2. Occupational profiles are quite similar in most fields. However, in chemical and building technology, female similarity indexes are very low. In chemical technology, the occupational profile of Swedish females is much wider than the profile of Finnish females. Most Finnish females educated in the field of chemical technology are employed as laboratory assistants (66%). In Sweden, the largest occupational group, employing 14%, is chemical processing work.

Table 17. Similarity and domain indexes in technical programmes

Secondary	Similarity index		Occupational domain index			
programmes	Male	Female	Swe-male	Fin-male	Swe-female	Fin-female
Building technology	0.69	0.16	5.80	7.09	7.36	6.39
Electro/tele-technology	0.98	0.94	4.69	4.30	8.52	6.98
Energy/vehicle technology	0.98	0.80	4.57	6.57	8.95	20.32
Chemical technology	0.88	0.43	10.17	7.88	16.82	2.27
Textile technology	0.76	0.90	11.80	25.96	14.53	13.06
Wood technology	0.97	0.86	4.17	7.19	7.76	11.44
Food technology	0.97	0.91	4.89	6.28	8.27	6.67
Graphical technology	0.98	1.00	2.43	3.23	2.47	2.34
Other technical programmes	0.50	0.50	14.94	10.88	21.37	22.28

In building technology, the difference between female domains in Sweden and in Finland is smaller but the similarity index is only 0.16. The following figures show the main occupational profiles. We can see that for both sexes the difference is caused by the fact that in Finland, secondary building technology education leads to a greater extent to engineering/technician occupations, whereas in Sweden, most of the building technology diploma holders work in manual occupations. This may be partly due to the different educational structures. An important question is, for instance, how are the educational levels connected to the hierarchies of technical work. However, this is only part of the answer. In the field of electro- and teletechnology, for instance, where the similarity of occupational profiles is notable, 9% of Swedish men work in the related engineering/technician occupations and 44% in manual occupations, compared to 15% and 45% in Finland.

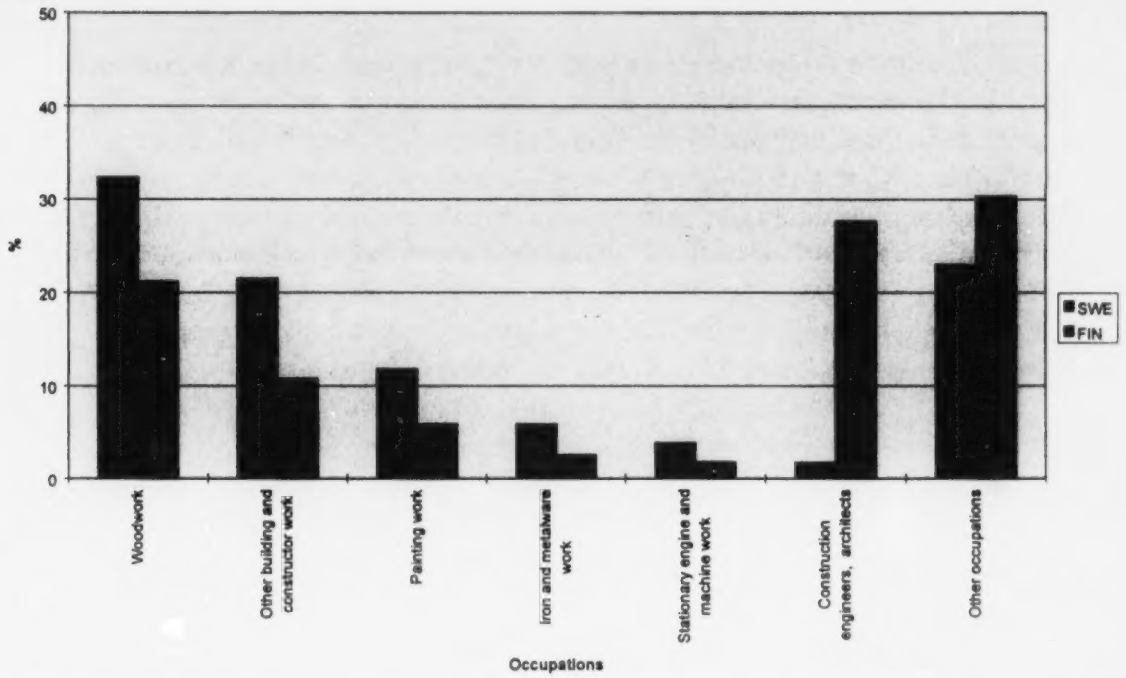


Fig. 20. Occupational profiles of males with secondary education in building technology

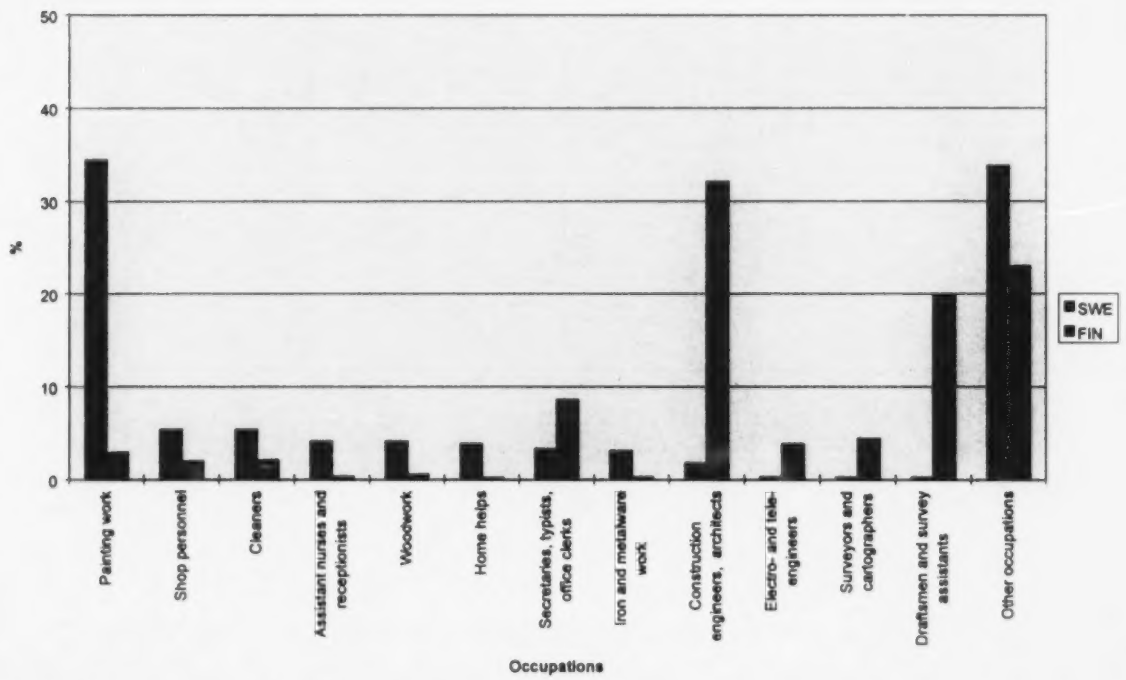


Fig. 21. Occupational profiles of females with secondary education in building technology

Other secondary programmes

Only a few comments on the rest of the secondary programmes are worth mentioning at this point. We can especially note the low similarity indexes of child care programmes (see Table 18). Because there are only 25 males with this education in Finland (3425 in Sweden), Figure 22 shows the occupational profiles of females only. In Sweden, most (60%) of those with secondary education in child care work in the private sector child care occupations, whereas in Finland, social workers are the largest occupational group with this education. It employs half of the diploma holders. In addition, in Sweden females with child care education work more often than in Finland as assistant nurses and receptionists (16% v 1.5%). In Finland they are employed as regular nurses (21% v 0.1%). This points to the different occupational structures in the fields of health care and social services which was already mentioned in connection to the tertiary social care education. For instance, in Finland, social workers are a relatively large occupational group employing 4.5 percent of the female labour force. In Sweden, this group employs only 2%. On the other hand, the group of child care in families employs 4.7% and 2.3% respectively.

In Sweden, the occupational group of child care in families seems to be more professionally organised than in Finland. Almost half (46%) of the Swedish female employees have education in child care compared to only 1.8% in Finland. In Finland 52% are uneducated (21% in Sweden) and 18% have education in the field of hotel and catering.

Table 18. Similarity and domain indexes in other secondary programmes

Secondary programmes	Similarity index		Occupational domain index			
	Male	Female	Swe-male	Fin-male	Swe-female	Fin-female
Maritime programmes	0.74	0.52	11.70	13.97	10.94	22.23
Vehicle programmes	0.98	0.99	3.95	2.11	4.34	2.45
Other transport prog.	0.13	0.14	8.33	9.27	5.82	6.91
Nursing	0.78	0.75	5.89	6.27	2.74	5.16
Dental nursing	0.91	1.00	3.33	2.03	1.44	1.34
Child care	0.18	0.12	6.39	7.53	2.55	3.31
Other health prog.	0.10	0.23	13.60	1.93	5.56	10.30
Agricultural etc. prog.	0.97	0.80	7.89	5.28	9.48	6.11
Hotel and catering	0.92	0.78	6.80	11.25	7.47	15.82
Fire fighting	0.99	0.32	1.99	1.30	6.74	1.16
Military prog.	0.49	..	27.48	2.53	8.33	..
Other service prog.	0.08	0.62	18.92	1.90	17.23	2.37

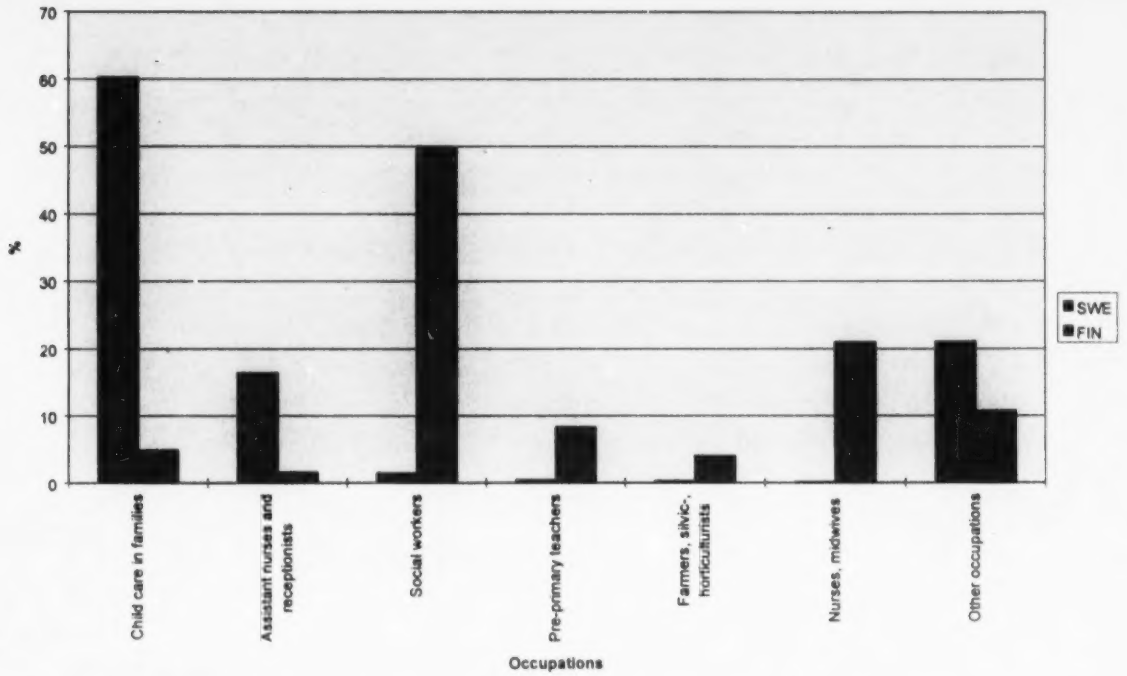


Fig. 22. Occupational profiles of females with secondary child care education

Another interesting difference is secondary military education where the Swedish male occupational domain is 27 and the Finnish domain only 2.5. The explanation derives mainly from different educational orientation of the programmes which in Sweden also emphasise engineering qualifications. Consequently, the male profile in Sweden also includes engineering occupations. In Sweden, only 8% of men with secondary military education are occupied in the army compared to 60% in Finland.

Changing Occupational Profiles – Some Complementary Findings

As mentioned at the beginning, the data include two cross-sections in time and four age groups. In order to study fully and compare these groups, additional changes in the educational and occupational classifications would have been necessary. However, building several comparable classification systems with sufficient observations was outside the scope of this project. Thus, in this part, only some preliminary findings will be considered and some exemplifying cases will be presented.

The two variables, year and age, naturally account for partly the same changes in time which include, first, the effects of occupational mobility and the related differences between the labour markets of different age groups, and secondly, the changes in the occupational and educational structures.

There are various general tendencies related to these changes which cannot be fully explored in this report. Some of the structural changes have already been described above. In addition, there is a general tendency that young people start their careers in different entry occupations which are specific to each field and then move up usually towards professional and managerial positions. During the 1980s, educational preferences of young people have also changed and the educational provision has increased and diversified.

Table 19 shows the changes in the similarity and domain indexes between 1980 and 1990.[7] A value below zero indicates, on the one hand, increasing similarity between the profiles and, on the other hand, increasing variation in the occupational domains. An overall observation is that there is no clear pattern between similarity and domain changes. In the case of men, there are more educational programmes in which occupational similarities have been increasing during the 1980s. Within these educational groups in Sweden, occupational profiles have also tended to become wider whereas in Finland there are more educational programmes which have experienced reduction in the domain index. This is the case, for instance, in tertiary agricultural and forestry programmes or in secondary building technology. In the field of humanities and secondary nursing, for instance, male and female occupational domains have increased in both countries.

[7] Small educational groups are excluded.

Table 19. Similarity and domain index changes from 1980 to 1990

	Similarity ratio 1980/90		Occupational domain ratio 1980/90			
Educations	**Male**	**Female**	**Swe-male**	**Fin-male**	**Swe-female**	**Fin-female**
Fine and applied arts	0.93	1.03	0.81	1.00	0.90	1.16
Theology	1.00	0.77	0.93	1.03	1.08	0.87
Humanities	1.10	1.18	0.33	0.78	0.36	0.77
Pre-primary teacher training	1.00	1.00	0.52	0.77	0.99	0.88
Primary teacher training	1.00	1.00	0.93	0.94	0.93	0.93
Training in occup. subj.	1.00	1.04	0.87	0.82	0.63	1.03
Training in aesthetics subj.	1.01	1.01	0.78	0.80	0.88	0.81
Business economics	1.22	1.13	1.14	1.00	1.21	1.09
Law	0.97	0.95	0.91	1.00	0.83	1.05
Journalism	1.01	1.00	0.89	1.14	1.04	1.21
Social work	1.03	0.99	0.96	0.91	0.97	0.95
ADP	1.00	1.02	1.29	1.23	0.95	1.58
Social sciences	1.09	1.29	1.02	0.98	1.05	1.03
Architecture	1.00	1.00	0.95	1.09	1.13	1.02
Engineering/construction	1.01	0.94	0.97	1.23	1.01	0.90
Engineering/electro-tele	0.96	0.97	1.11	1.26	1.18	1.21
Engineering/mechanical	0.90	0.82	0.98	1.29	1.22	1.25
Engineering/chemical	0.96	1.06	0.99	1.18	1.31	1.59
Natural sciences	1.14	1.36	0.64	0.97	0.45	0.74
Ship's officer education	1.06	..	0.72	1.06	..	..
Pharmacology	1.05	1.04	0.59	1.20	0.70	1.07
Laboratory nursing	..	0.64	..	..	0.94	0.97
Medicine	1.00	1.00	0.95	0.98	0.92	0.99
Pharmaceutics	0.86	1.00	1.01	1.62	1.06	1.26
Physiotherapy	..	0.99	..	..	0.85	1.06
Basic nursing	1.00	1.00	0.92	1.08	0.98	0.99
Social care	0.22	1.04	0.73	0.59	0.86	0.88
Dentistry	1.00	1.00	0.94	1.02	0.94	0.98
Veterinary medicine	1.00	1.00	0.91	1.02	1.03	1.15
Agriculture programmes	0.87	0.90	0.70	1.44	0.87	1.36
Forestry programmes	0.61	0.73	0.59	1.60	1.24	1.76
Police education	0.99	..	1.04	1.23	..	..
Military education	1.00	..	1.55	1.40	..	..
Arts programmes	1.18	0.92	0.77	0.90	0.63	1.01
Teacher training	2.25	2.33	1.22	1.22	0.91	1.27
Business programmes	1.02	1.00	0.83	0.92	0.80	0.87
Social studies	0.79	0.88	0.88	0.78	0.63	0.93
Building technology	0.85	0.54	0.71	1.07	0.48	1.06
Electro/tele-technology	0.99	0.99	0.98	0.93	0.89	0.93
Energy/vehicle technology	1.00	1.00	0.72	0.91	1.00	0.88
Chemical technology	0.98	1.06	0.89	1.00	0.54	1.12
Textile technology	0.94	0.78	0.61	0.97	1.03	0.66
Wood technology	1.00	0.90	0.89	1.07	0.97	1.02
Food technology	1.01	1.06	0.69	0.93	0.66	0.95
Graphical technology	0.98	0.95	1.04	0.94	2.31	1.13
Maritime programmes	0.95	1.56	0.82	0.46	0.41	0.27
Vehicle programmes	0.57	0.38	2.82	0.90	1.04	0.75
Nursing	1.17	0.92	0.55	0.81	0.72	0.87
Dental nursing sec.	..	1.00	..	..	0.75	0.89
Child care	..	1.13	..	..	1.01	1.06
Agricultural etc. prog.	1.02	1.17	0.75	1.32	0.86	0.77
Hotel and catering	0.86	1.01	0.70	1.01	1.03	1.03
Fire fighting	0.98	..	1.24	0.94	..	..
Military prog.	1.94	..	0.21	1.32	..	..

Opposite examples of decreasing occupational spread are rare, however. Only in the field of electro- and tele-engineering, business economics and pharmaceutics, and in police and military education including only males, occupational domains in both countries have become narrower.

There are, potentially, two independent processes affecting these changes. In some fields vocational/professional educational programmes have been developed to meet the needs of specialised occupational tasks. On the other hand, both mismatch and multimatch of education and occupations is increasing. By multimatch we mean that educational programmes tend to become more general in nature, when judged by their labour market effects, in a situation where employment practices emphasise personal skills and occupational skills are increasingly learned on the job.

Just to give a few examples, we will look closer at three educational programmes. Figure 23 shows the change in the occupational profile of male humanists in Sweden. The domain index has increased from 3.9 to 11.9 (giving the ratio of 0.33 in Table 19). As we can see from the figure, the share of those working as school teachers has decreased from 48% to 20%. Respectively, the number of those working in other occupations has increased during the 1980s. The situation of Swedish females is basically similar. In Finland, the change is much smaller as the higher ratios in Table 19 indicate. From the occupational perspective, the corresponding change means that in Sweden, the share of primary and secondary teachers having teacher training has increased and the share of those having a humanities degree has decreased. In Finland, a similar change cannot be seen.

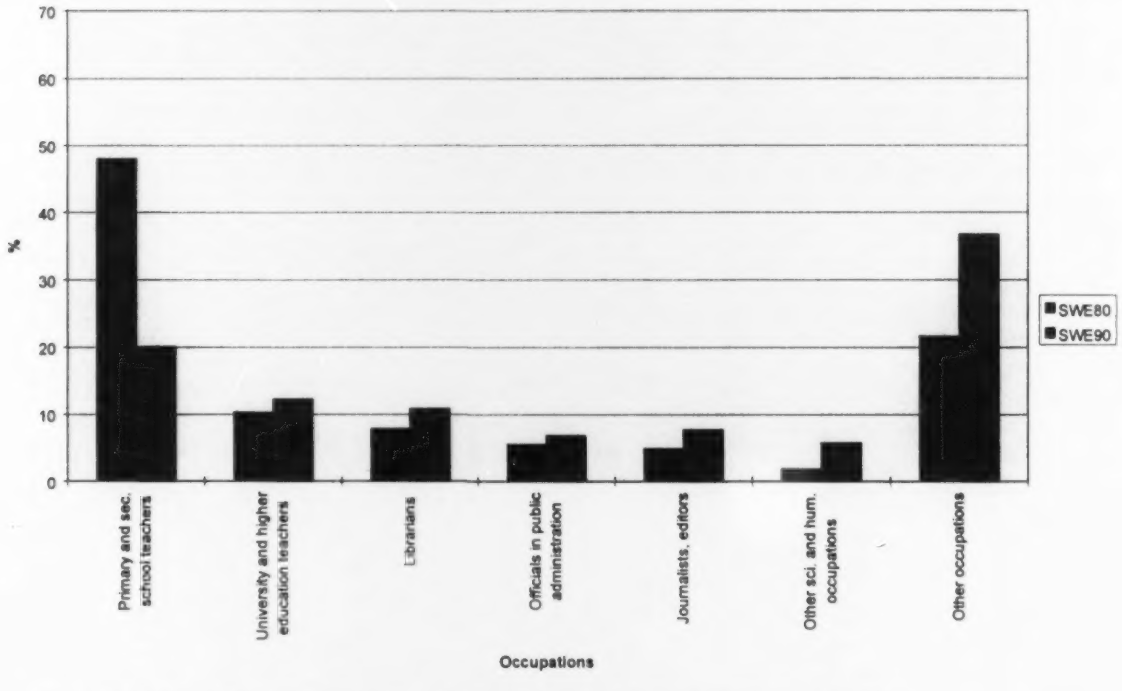


Fig. 23. Change in the occupational profile of male humanists in Sweden

BEST COPY AVAILABLE

Figure 24 shows the situation of Finnish females with ADP-education. As Table 19 indicates, their occupational profile has become narrower. Domain index was 2.1 in 1980 and 1.3 in 1990. Figure 24 shows that the number of females with specialised ADP-education working in related ADP occupations was already very high in 1980 (67%) and that the share has increased to 86% in 1990. At the same time, the share of ADP workers having ADP education has increased from 5% to 14%. The majority of females in APD occupations have been trained within various secondary business programmes which obviously also produce some ADP-qualifications.

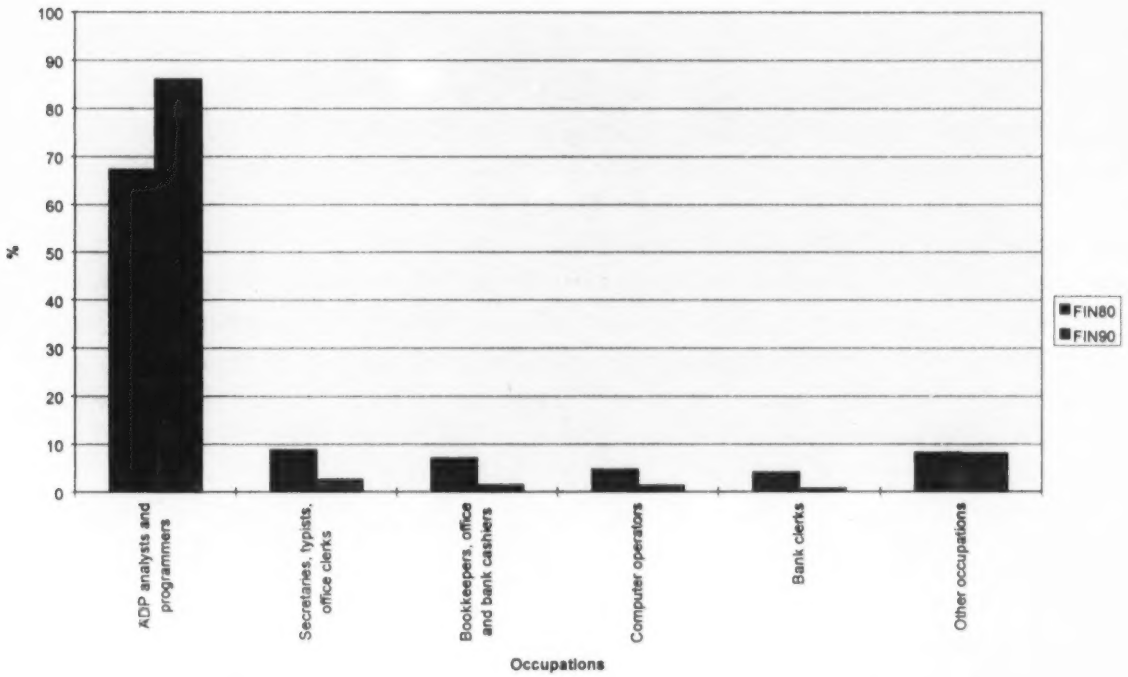


Fig. 24. Change in the occupational profile of females with ADP-education in Finland

The final example is secondary education in graphical technology and the change in the occupational profile of Swedish females. The high ratio in Table 19 (2.3) indicates a considerably narrowing occupational domain. As Figure 25 clearly shows, Swedish females educated in this field have been moving towards graphic work occupations which employed 63% of them in 1990. However, as in most manual occupations, the number of educated workers is relatively low. In 1990, 43% of Swedish females in this occupational group were uneducated and only 7% had secondary education in graphical technology. The situation is naturally different in the younger age groups which are generally more educated than the older ones. In this particular case, domain index increases with age indicating that the match between education and occupation is better in the younger age groups.

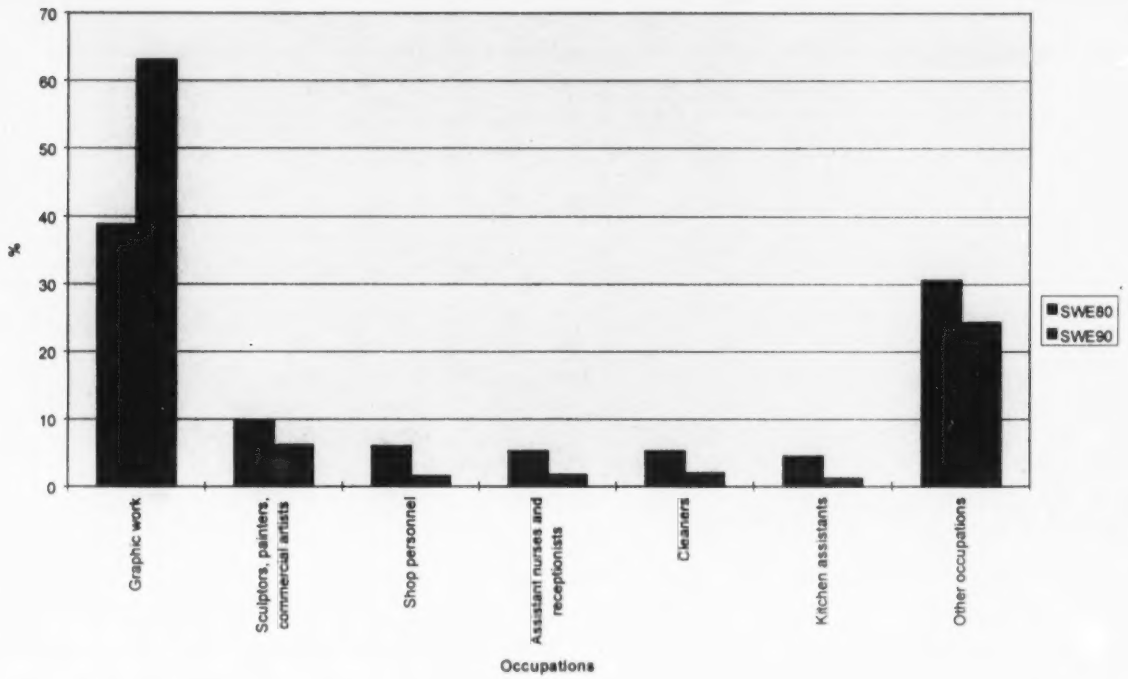


Fig. 25. Change in the occupational profile of females with graphical technology education in Sweden

The following table describes the similarities in different age groups in some selected educational programmes in 1990. The conclusion is, again, that there is no unequivocal pattern between the similarities or dissimilarities and age. We can find educational programmes where the similarity of occupational profiles increases by age and those where similarities decrease. In some groups, there is no clear linear trend either way. The selected programmes in Table 20 are mainly those which have been dealt with in the previous chapters.

For instance, in social sciences we can see that occupational profiles are considerably more similar in the older age groups than in the younger. In Sweden, the majority of young men with social science degrees are working as ADP analysts, while Finnish men are spread throughout occupations in administration and education. Older men, on the other hand, are more evenly working in managerial positions and teaching occupations. The situation of female social scientists is basically similar, except that young females tend to end up in social work, and that older workers are more often psychologists in Finland than in Sweden.

Table 20. Similarity indexes in selected educational groups in 1990 by age and gender

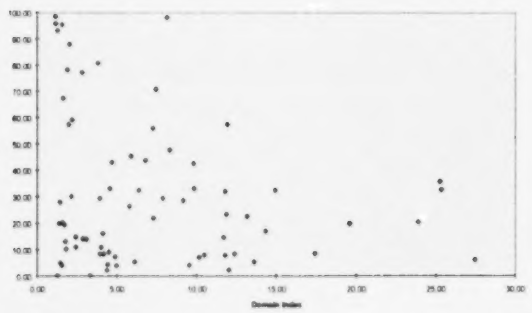
	Males				Females			
TERTIARY PROG:	**<30**	**30-39**	**40-49**	**50-**	**<30**	**30-39**	**40-49**	**50-**
Humanities	0.89	0.71	0.78	0.95	0.80	0.71	0.75	0.90
Social sciences	0.53	0.70	0.89	0.95	0.44	0.48	0.72	0.92
Engineering/chemical	0.69	0.81	0.75	0.75	0.86	0.83	0.85	0.70
Natural sciences	0.96	0.80	0.76	0.93	0.88	0.61	0.66	0.93
Basic nursing	0.99	0.99	0.99	0.97	1.00	1.00	1.00	1.00
Agriculture programmes	0.83	0.80	0.93	0.79	0.85	0.83	0.77	0.57
SECONDARY PROG.								
Arts programmes	0.29	0.84	0.77	0.81	0.65	0.64	0.80	0.46
Teacher training	0.21	0.33	0.47	0.32	0.26	0.25	0.47	0.58
Business programmes	0.84	0.84	0.84	0.81	0.91	0.98	0.98	0.97
Social studies	0.61	0.48	0.50	0.45	0.86	0.86	0.91	0.79
Energy/vehicle technology	0.99	0.99	0.97	0.90	0.65	0.67	0.94	0.93
Nursing	0.69	0.81	0.83	0.73	0.72	0.81	0.75	0.57
Hotel and catering	0.97	0.87	0.79	0.79	0.88	0.78	0.69	0.51

In the field of humanities, the youngest and the oldest age groups have slightly more similar occupational profiles than the middle groups. The main difference comes from the shares of those working as school teachers, as already indicated in the previous analysis. In art programmes, young men have more varied profiles compared to the older groups. This difference is mainly caused by the fact that in Finland, men under 30 years of age are concentrated in woodwork and in some other manual occupations, whereas in Sweden, young men have found employment more often in related artistic fields. In the case of females with secondary arts education, the oldest age group has the most varied profiles. The reason for this is the tendency of older Finnish women to work in agricultural occupations.

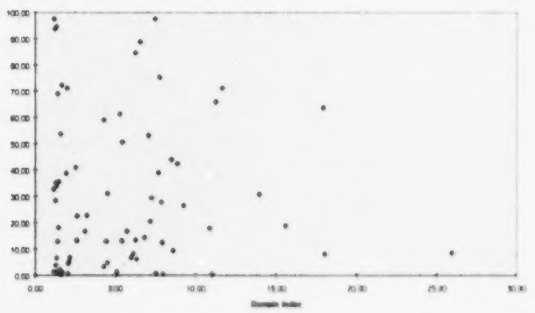
The matching

This final part presents one attempt to look at the overall matching of education and occupations in Sweden and Finland. As mentioned in the beginning (see Figure 1), there are both theoretical and empirical problems in this kind of matching analysis. Mapping the coordinates of an educational programme in the space of the varying domains presupposes an iterative approach. At this point, a simple solution is applied just to give a general idea of how different educational programmes can be located in the matching space.

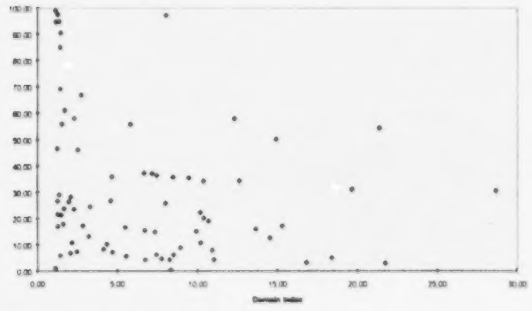
In the scatter plots of Figure 26, the X-axis represents the occupational domain showing groups of education which give access to a limited number of occupations and which lead to many different occupations. The Y-axis represents an approximation of the occupational specificity of an educational programme. It is calculated simply by finding an occupation which has the highest share of employees with the education in question.



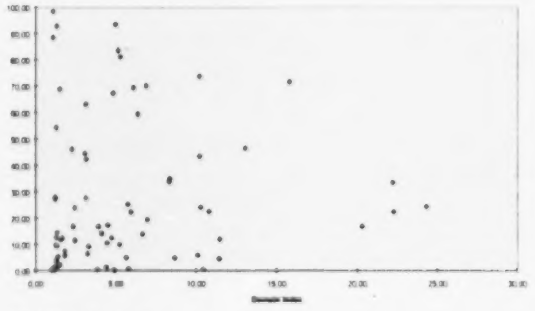
SWE/males



FIN/males



SWE/females



FIN/females

Fig. 26. The matching of education and occupations in Sweden and Finland in 1990

At the upper left corner of the scatter plots we have educational groups like medicine or law which lead to professional occupations where practically all employees have the education in question. It seems that the quite rough estimate of occupational specificity produces a space where most of the educational groups are concentrated in the lower left corner of the plots. Thus, the basic form of the scatter plots is similar indicating that the four fields of matching are similarly structured in Sweden and Finland. Individual dots, however, seem to be located in slightly different places.

BEST COPY AVAILABLE

The following tables list the individual educational programmes according to the typology proposed in Figure 1. The cut point for the occupational domain is 4.99 which is approximately the median value. In the case of occupational specificity, 50% was selected as the cut point. The tables show how educational programmes are located in the four different fields in Sweden compared to Finland. Educational groups which are in boldface are located in the same field in each country. The bracketed letters indicate those fields to which the educational programme belongs in Finland. For instance, education in law and natural sciences in the case of males have in both countries relatively wide occupational domain and they also have a relatively high occupational specificity. Education for ship's officers, on the other hand, has high occupational specificity but in Sweden it has wider occupational profile than in Finland.

Table 21. Typology of education in the space of matching, males

	Narrow occupational domain	Wide occupational domain
High occupational specificity	**Dentistry** A **Medicine** **Veterinary medicine** Police education [C] Basic nursing [C] **Pharmacology** Military education [C] **Pre-primary teacher training** **Theology** Psychology [C] Fire fighting [C]	**Law** B Ship's officer education [A] **Natural sciences**
Low occupational specificity	Electro/tele-technology [A] C Energy/vehicle technology [B] **Subject teacher training** **Primary teacher training** **Journalism** Social work [D] **Study and LM guidance** **ADP** **Pharmaceutics** **Training in aesthetics subjects** **Graphical technology** **Engineering/construction** **Training in occup. subjects** Engineering/electro-tele [D] Wood technology [D] **Vehicle programmes** Food technology [D] **Architecture** Teacher training sec. [D] **Social care**	Nursing sec. [B] D Hotel and catering [B] Business economics [B] **Social studies** **Fine and applied arts** Business programmes [B] **Child care** Agricultural etc, programmes sec. [B] **Agriculture programmes** Building technology [B] Humanities [C] Forestry programmes [C] **Arts programmes** Social sciences [B] **Maritime programmes** **Engineering/chemical** **Textile technology** **Chemical technology** Military programmes [C] **Engineering/mechanical** **Polytechnical programmes**

Table 22. Typology of education in the space of matching, females

	Narrow occupational domain	Wide occupational domain
High occupational specificity	**Dentistry** A **Veterinary medicine** Basic nursing [C] **Medicine** **Pre-primary teacher training** **Pharmaceutics** Nursing sec. [B] Psychology [C] **Theology** Laboratory nursing [C]	**Law** B
Low occupational specificity	Primary teacher training [A] C **Child care** Agriculture programmes [D] Physiotherapy **Library science** **Social work** **ADP** **Journalism** **Leisure time instruction** **Work therapy** **Architecture** **Training in aesthetics subjects** **Pharmacology** **Subject teacher training** **Training in occup, subjects** **Social care** **Vehicle programmes** **Graphical technology** Engineering/electro-tele [D] **Study and LM guidance** **Dental nursing sec.** **Dental nursing**	Business programmes [A] D Forestry programmes [C] Hotel and catering [B] **Business economics** Agricultural etc, programmes sec. [B] Natural sciences [B] **Fine and applied arts** **Arts programmes** **Social studies** Humanities [C] Engineering/construction [C] Social sciences [B] **Engineering/chemical** **Teacher training** Building technology [B] **Textile technology** **Energy/vehicle technology** **Maritime programmes** **Engineering/mechanical** **Electro/tele-technology** **Wood technology** **Food technology** Chemical technology [C] **Polytechnical programmes**

As mentioned above, this is only the first step in the iterative search for the match. We can see, for instance, that field B includes relatively few educational groups. In the case of Swedish females, only studies in the field of law represent this type of matching. In Finland also secondary nursing education, natural and social sciences, hotel and catering, agricultural and building technology programmes belong to this field which describes education that leads to different professional or semi-professional occupations. The tables also suggest that, for both males and females, there are more educational programmes where the matching is professional in nature in Sweden than in Finland.

Conclusions

In this study, the matching of educational and occupational structures in Sweden and Finland have been compared by using classifications which include all educational and occupational groups. In spite of the basic similarities of the educational systems and the common ground of the Swedish and Finnish educational and occupational standard classifications, some important differences and classificational problems remain and they should be kept in mind when interpreting these results.

Although an attempt was made to apply as fine an educational classification as possible, it is obvious that many of the groups used still comprise relatively different educational programmes. Another weakness in the educational classification is that it only separates two levels dividing the groups into secondary and tertiary courses which, for instance, makes comparisons to the Dutch-Irish research problematic. However, we agree with the conclusions of Borghans et al. (1998) that the similarity and domain indexes which were applied in the analysis provide a useful tool to compare educational systems and occupational profiles between different countries.

In addition to the index analysis, selected occupational profiles were also analysed in detail to show the actual differences and nature of employment. This provided additional and useful information on both the matching of education and occupations and on the problems of data and classifications.

In accordance with previous matching research in Finland (see Ahola et al. 1991), this study clearly shows that except for the professional fields where there is a close connection between education and occupation, persons with different educational backgrounds get matched up with various occupations in a relatively elastic way. Occupational domains are wide and, in addition, the tails of occupational profiles are relatively long. In Sweden about two thirds of the educational groups have occupational profiles in which miscellaneous occupations account for more than 20%. A considerable part of this is probably due to random errors in the original statistical data. However, at least in tertiary education, comparisons of 1980 and 1990 data indicate that the wider domains in Sweden also describe real existing differences in the matching process. Tentative explanations include the diversified nature of the Swedish comprehensive higher education system compared to the more unified Finnish system, and also the deeper differentiation of Swedish society at large.

On the other hand, however, the basic occupational destinations of most educational programmes are relatively similar in Sweden and Finland. Thus, there shouldn't be any major obstacles for occupational mobility between these two countries in this respect. Differences occur in certain fields in which the educational structures and the related labour markets are constructed differently. These are typically sectors of the welfare state which have experienced rapid growth during the 1980s, i.e. teaching and the partly overlapping social and health care sectors. Table 23 lists those educational groups where occupational profiles are most different. It should be noted, however, that both lists include educations which are typical choices for the opposite sex, and especially in the Finnish data there are only few observations in these groups. Nevertheless, it seems that in

Sweden females have more equal opportunities in the related occupational fields than in Finland.

Table 23. Educations which have the most differing occupational profiles between Finland and Sweden

Males	Similarity index		Females
Laboratory nursing	0.08	0.08	Employment
Child care	0.18	0.10	Laboratory nursing
Employment	0.19	0.10	Social care
Teacher training	0.36	0.12	Child care
Military programmes	0.49	0.16	Building technology
Social studies	0.52	0.25	Police education
Business economics	0.59	0.32	Fire fighting
Social care	0.65	0.35	Teacher training
Social work	0.69	0.35	Ship's officer education
Building technology	0.69	0.43	Chemical technology

The study of the changes which have occurred during the 1980s indicate that educational expansion and the changes in occupational structures are partly independent processes but that they also share important points of convergence in technological development. It is very difficult to establish a causal link between educational expansion and occupational development. It is usually claimed that changes in the occupational structure of employment can only explain a modest part of the increase in the level of workforce qualifications. A British study, for instance, concludes that the increased holding of qualifications by each successive age group simply results in employers of each occupation heightening their educational requirements, as could be suggested by the credentialist hypothesis. The predictability of this process argues against an interpretation based on skill biased changes in the demand for labour, which would be expected to have a differential impact across occupations. The conclusions suggest further that the outputs of the education and training system in Britain did not merely keep pace with labour market changes, but allowed employers to hire more qualified people for essentially the same jobs. (Robinson & Manacorda 1997; see also Mallet et al. 1997.)

It also seems that in certain fields occupational domains are narrowing whereas in other fields they are widening. Narrowing occupational profiles can be found in those fields where vocational/professional educational programmes have been developed to meet the needs of specialised occupational tasks. On the other hand, both mismatch and multimatch of education and occupations is increasing. Multimatch means that educational programmes tend to become more general in nature, when judged by their labour market

effects, in a situation where employment practices emphasise personal skills and occupational skills are increasingly learned on the job (see Kivinen & Ahola 1998).

The analysis of matching has been rather preliminary in this report because of the methodological problems involved. However, our experiment shows that it is possible to map educational programmes in a space defined by the occupational domain and the professional nature of the education-occupation connection. This mapping provided further information on the similarities and differences of the matching processes in Sweden and Finland. Further research is necessary to adjust the matching analysis and to select education-occupation clusters for a refined and more qualitative analysis. More information on the problems of mismatch and multimatch is needed in order to understand, for instance, why so many people are working in occupational tasks which do not match with their formal education. An important question in this respect is, for instance, how the opportunities for mobility affect the matching process.

Until now, VET policy and guidance have been trying to balance between the contradictory pleads for (too) narrow specialisation and often rather superficial flexibility. At the moment they seem to be merging into ideas of 'flexible specialisation' well suited to the current labour market rhetoric which emphasise flexible and flat organisations, entrepreneurship and new industries which are also supposed to solve employment problems. It is also clear that in many cases, the knowledge and skills possessed by workers are being underutilised. By developing the organisation of work tasks and production, it is likely that far more efficient use could be made of the reservoir of already existing qualifications (Bailey 1991).

This study also indicates that the problems of mismatch and multimatch are highly field specific, and related to gender and age. Thus, a more refined and qualitative research is needed in order to answer the underlying question of matching: how do individuals with certain educational background get matched up with different occupations?

References

Ahola, S. (1997) The Matching of Educational and Occupational Structures in Finland and Sweden. Paper presented at the CIRETOQ group A meeting. Brussels, 21st of November 1997.

Ahola, S., Kivinen, O. & Rinne, R. (1991) Koulutuksesta työelämään. Koulutus ja ammattirakenteiden kytkeytyminen. Turun yliopisto. Koulutussosiologian tutkimusyksikkö. Turkimusraportteja 7. Turku.

Ahola, S., Kivinen, O. & Rinne, R. (1992a) Transition from Secondary to Higher Education. In O. Kivinen & R. Rinne (eds.) Educational Strategies in Finland in the 1990s. Research Unit for the Sociology of Education. University of Turku. Research Reports 8, pp 17-36. Turku.

Ahola, S., Kivinen, O. & Rinne, R. (1992b) The Problems of State Educational Planning. In O. Kivinen & R. Rinne (eds.) Educational Strategies in Finland in the 1990s. Research Unit for the Sociology of Education. University of Turku. Research Reports 8, pp 85-109. Turku.

Bailey, T. (1991) Jobs of the Future and the Education they Will Require: Evidence from Occupational Forecasts. Educational Researcher 20, 2, 11-20.

Bell, D. (1973) The Coming of the Post-industrial Society. New York: Basic Books.

Borghans, L., Hughes, G. & Smits, W. (1998) The Occupational Structure of Further and Higher Education in Ireland and the Netherlands. ROA/ESRI. CEDEFOP Document, Thessaloniki.

Braverman, H. (1974) Labour and Monopoly Capital. New York: Monthly Press Review.

Bridges, W.P. (1996) Educational Credentials and the Labour Market: An Inter-Industry Comparison. In A. Kerckhoff (ed.) Generating Social Stratification. Toward a New Research Agenda. Oxford: Westview Press, pp. 173-199.

Collins, R. (1971) Functional and Conflict Theories of Educational Stratification. American Sociological Review 36, 6, 1002-1019.

Collins, R. (1979) The Credential Society. New York: Academic Press.

Gallie, D. (1991) Patterns of Skill Change. Upskilling, Deskilling or the Polarisation of Skills. Work, Employment and Society 5, 3, 319-351.

Granovetter, M. (1981) Toward a Sociological Theory of Income Differences. In I. Berg (ed.) Sociological Perspectives on Labour Markets. New York: Academic Press.

Gulowsen, J (1988) Skills, Options and Unions: United and Strong or Divided and Weak? In R. Hyman & W. Streeck (eds.) New Technology and Industrial Relations, pp 160-173. Oxford: Basil Blackwell.

Hunter, A. (1988) Formal Education and Initial Employment: Unravelling the Relationship Between Schooling and Skills over Time. American Sociological Review 53, 4, 753-765.

Kerckhoff, A. (1996) Building Conceptual and Empirical Bridges between Studies of Educational and Labour Force Careers. In A. Kerckhoff (ed.) Generating Social Stratification. Toward a New Research Agenda. Oxford: Westview Press, pp. 37-56.

Kivinen, O. & Ahola, S. (1988) Higher Education as Human Risk Capital. Paper presented at the 11th annual CHER conference, 3-5 September 1998, Kassel.

Lewis, T. (1996) Studying the Impact of Technology on Work and Jobs. Journal of Industrial Teacher Education 33, 3, 44-62.

Lewis, T., Stone, J., Shipley, W. & Madzar S. (1998) The Transition from School to Work. An Examination of the Literature. Youth & Society 29, 3, 259-292.

Mallet L. et al. (1997) Certificates, Skills and Job Markets in Europe. Vocational Training No. 12 Septemper – December 1997, pp. 20-34.

Masuda, T. & Muta, H. (1996) Vocational Education and Training in Japan from Industrys Perspective. Industry and Higher Education 11, 1, 43-52.

Neave, G. (1996) Higher Education in Transition: Twenty-Five Years On. Higher Education Management 8, 3, 15-24.

OECD (1983) Education and Work. The Views of the Young. Paris: OECD.

OECD (1992) From Higher Education to Employment. Paris: OECD.

Psacharopoulos, G. (1986) Links Between Education and the Labour Market: a Broader Perspective. European Journal of Education 21, 4, 409 415.

Psacharopoulos, G. (1991) The Perennial Mismatch and Ways to Solve It. Vocational Aspect of Education, 42, Apr, 127-132.

Robinson P. & Manacorda M. (1997) Qualifications and the Labour Market in Britain: 1984-94 Skill Biased Change in the Demand for Labour or Credentialism? Discussion Paper no. 330. February 1997. Sited at:
http://cep.lse.ac.uk/papers/discussion/dp0330.html, 11/98.

Rosenbaum J.E. et al. (1990) Market and Network Theories of the Transition from High School to Work: Their application to industrialised societies. Annual Review of Sociology 16, 236-299.

Rumberger, R. (1981) The Changing Skill Requirements of Jobs in the U.S. Economy. Industrial and Labour Relations Review 34, 4, 578-590

Senker, P. (1989) Technical Change, Work Organisation and Training: Some Issues Relating to the Role of Market Forces. New Technology, Work and Employment 4, 1, 46 53.

Spenner, K. (1983) Deciphering Prometheus: Temporal Change in the Skill Level of Work. American Sociological Review 46, 6, 824 837.

Sørensen, A. & Kalleberg, A. (1981) An Outline of a Theory of the Matching of Persons to Jobs. In I. Berg (ed.) Sociological Perspectives on Labour Markets. New York: Academic Press.

Statistics Finland (1989) Koulutusluokitus 1988. Finnish Standard Classification of Education. Helsinki: Tilastokeskus.

Statistics Finland (1995) Väestön taloudellinen toiminta ja asuinolot 1970-1990. Economic Activity and Housing Conditions of the Population. SVT, Väestö 1995:6. Helsinki: Tilastokeskus.

Statistics Sweden (1994) Trender och prognoser '94. Stockholm: Statistiska centralbyrån.

Statistics Sweden (1996) Svensk utbildningsnomenklatur (SUN). Swedish Standard Classification of Education. SCB, Meddelanden i samordningsfrågor 1996:1. Stockholm: Statistiska centralbyrån.

Statistics Sweden (1998) SSYK 96 : Standard för svensk yrkesklassificering 1996. Swedish Standard Classification of Occupations 1996. Stockholm: Statistiska centralbyrån.

Unesco (1983) The Transition from Technical and Vocational Schools.

Whitte J.C. & Kalleberg A. (1995) Matching Training and Jobs: The Fit Between Vocational Education and Employment in the German Labour Market. European Sociological Review 11, 3, 293-317.

Appendix A: Educational classification

Statistics Sweden 1994 App. 1 p. 177	Code	Classification of Education 1988 Statistics Finland 1989	Comments
1. Tertiary (ISCED 5-7)			
1a. Arts and humanities			
Library science	01	63711,63713	
Fine and applied arts	02	511-514,611-613,711-714,817-818	
Theology	03	715,811-812	
Humanities	04	515,615,7161-7174,8131-8143,8151-8163	
(Free courses)	05-		
Other arts and hum. prog.	06	519,616-619,7179,718-719,8149,8169,819	
1b. Teacher training			
(Leisure time coaching)	07-		
Leisure time instruction	08	5252	
Pre-primary teacher training	09	521,6241	
(Primary teacher training)	10-		
Primary teacher training	11	522-523,621-622,7211-7212	
Subject teacher training	12	6212-6219,7213-7214,7221-7228,7245	
Training in occup. subj.	13	5241-5244,6246,7248	
Training in aesthetics subj.	14	5245-5249,5253,6244-6245,7242,7246-7247	
Other teacher training	15	5251,5254,5297-5299,6299,7219,7229,7299	
1c. Social and behavioural sciences			
Business economics	16	6321-6325,7321-7326,8331-8334,8341-8344	
Law	17	731,831-832	
Journalism	18	53972,63741	
Psychology	19	7353,8376,8386	
Social work	20	63721-63734	
ADP	21	5331	
Social sciences	22	7327-7328,733-734,7351-7352,7381,8335-8336,8345-8346,8351-8375,8381-8385	
Study and LM guidance	23	6247,7215	
	24-		
Other SB-programmes	25	531,5332,534,53971,53988-53999,631,633-636,63748-63749,6399,7399,839	
1d. Technology and natural sciences			
Architecture	26	74411-74416,74418-74419,84261-84265,84268-84269,84461-84465,84468-84469	
(Technical maintenence)	27		-> 37
Engineering/construction	28	7418-7419,8418-8419,8438-8439	
Engineering/electro-tele	29	7415-7417,7435-7437,8415-8417,8425,8435-8437,8445	
Engineering/mechanical	30	7411-7414,74391,74393,8411-8414,84281,84285,8431-8434,84481,84485	
Engineering/chemical	31	7421-7426,8421-8424,8441-8444	
Other engineering	32	74392,74394-74399,84287,84294-84299,84483,84486-84499	
Natural sciences	33	745-746,845-846	
Polytechnical programmes	34	541-546,641-643	-> 37
(High school engineers)	35		
(Free courses)	36-		
Other technical education	37	548-549,644-645,648-649,748-749,849	
1e. Transportation			
Ship's officer education	38	551,651	
Other transport prog.	39	552,559,652,659	

BEST COPY AVAILABLE

1f. Medical and health care			
Pharmacology	40	764,8671,8681	
Work therapy	41	5627	
Laboratory nursing	42	5625	
Medicine	43	761,861-863	
Pharmaceutics	44	566,666	
Physioteraphy	45	5624	
Basic nursing	46	5611-5619,5623,5626	
Social care	47	5621-5622,5671-5672	
Dental nursing	48	5628	
Dentistry	49	762,865	
Veterinary medicine	50	763,866	
Other health programmes	51	5631-5633,569,661-664,668-669,768-769,8672,8682,869	
1g. Agriculture, forestry, fishing			
Agriculture programmes	52	74417,771,7731-7733,84266,84466,8711-8712,8721-8722	
Forestry programmes	53	772,7734-7736,8713-8714,8723-8724	
Other agriculture etc. prog.	54	57,67,7738-7799,8716-8719,8726-8799	
1h. Services			
Police education	55	5811	
Military education	56	5821-5823,681,781-783,881	
Other service education	57	584-589,688-689,788-789,889	
1i. Other tertiary programmes	58	59,69,79,89	
2. Secondary programmes (ISCED 3)			
(High school / social)	59		-> 89
(High school / natural)	60		-> 89
2a. Arts and humanities			
Arts programmes	61	31,41	
2b. Teacher training			
Teacher training	62	32,42	
2c. Social / administrative programmes			
Business programmes	63	3311-3362,431	
Social studies	64	3363,339,432-439	
(Natural sciences)	65		-> 89
2d. Technology programmes			
Building technology	66	3431-3434,4417-4419,4461-4464	
Electro/tele-technology	67	3425-3429,4415-4416,4455-4459	
(Energy)	68-		
(Transport)	69-		
Energy/vehicle technology	70	3411-3419,4411-4414,4441-4449	
Chemical technology	71	3441-3442,4422-4423,4468-4469	
Textile technology	72	3451-3454,4425,4476-4479	
Wood technology	73	3435-3437,4421,4465-4467	
Food technology	74	3455-3459,4426,4483-4484	
Graphical technology	75	3443-3447,4424,4473-4475	
Other technical programmes	76	3491-3499,4429-4439,4495-4499	
2e. Transport			
Maritime programmes	77	351,451	
Vehicle programmes	78	354	
Other transport prog.	79	359,452-459	

BEST COPY AVAILABLE

2f. Health care			
Nursing	80	3611,3616,3621-3622,3651-3653,4611-4616,4622,464	
Dental nursing	81	3613,4617	
Child care	82	3614	
Other health prog.	83	3617-3618,369,469	
2g. Agriculture, forestry, fishing			
Agricultural etc. prog.	84	37,47	
2h. Services			
Hotel and catering	85	384,484	
Fire fighting	86	3811,4811	
Military prog.	87	3815,4821-4823	
Other service prog.	88	3812-3813,3819,388-389,4812-4813,4829,488-489	
2i. Other secondary prog.	89	39,49	
9 Basic education	90-	30,40	See note
9 Unknown	91	99999	

Note: In Finland this group includes upper secondary school (*lukio*) degrees.

BEST COPY AVAILABLE

Appendix B: Occupational classification

Occupational groups	SWE OCCUP. CODE	FIN OCCUP. CODE
Technical, physical science, social science, humanistic and artistic work		
Construction engineers, architects	001	000,001,010
Electro- and tele-engineers	002	002,003,011,012
Mechanical engineers	003	004,013
Chemical engineers	004	005,014
Mining engineers	005	006,015
Other engineering work	006	007,016
Surveyors and cartographers	007	008,017
Draftsmen and survey assistants	008	018
Chemists, physicists	011	020,021
Geologists, meteorologists	013	022,023
Laboratory assistants	014	028
Veterinarians	021	024
Biologists	022	025
Research and consulting in agriculture	023	026
Research and consulting in forestry	024	027
Physicians	031	030
Dentists	032	031
Nurses, midwives	040	032,038
Psychiatric nurses	042	035
Assistant nurses and receptionists	043	033,036
Technical nursing assistants	045	037
Pharmacy work	046	040
Physiotherapists, masseurs	047	041,043
Other health care occupations	048	042,044,049
Primary and sec. school teachers	050, 052-055	051
University and higher education teachers	051	050
Pre-primary teachers	056	055
Educational consulting	057	056
Other occupations in education	058	059
Priests and preachers	061	060,061
Other religious work	068	062
Judges	071	070
Prosecutors and senior police officials	072	071
Practicing lawyers	073	072
Corporation lawyers	074	073
Other juridical occupations	078	079
Sculptors, painters, commercial artists	081	080,081
Industrial designers	082	085
Display decorators	083	082
Authors	084	083
Journalists, editors	085	084
Performing artists	086	086
Musicians	087	087
Other artistic and literary occupations	088	088,089
Auditors	091	090
Social workers	092	091
Librarians	093	094
Economists, statisticians	094	095
Psychologists	095	097
Personnel and employment service	096	098
ADP analysts and programmers	097	096
Other sci. and hum. occupations	098	099

BEST COPY AVAILABLE

Administrative, managerial and clerical work		
Officials in public administration	101	100
General business managers	111	110
Other business managers	118	111,112,113,114,115
Bookkeepers, office and bank cashiers	201,203	120,121
Cashiers in shops and restaurants	204	122
Debt collectors	208	129
Secretaries, typists, office clerks	290	130,131,150,159
Computer operators	291	140,141
Bank clerks	292	152
Travel agency clerks	293	155
Shipping agents	294	156
Property and store managers	295	157
Insurance raters and clerks	296	153
Social insurance clerks	297	154
Cost accountants	298	158
Sales work		
Wholesalers	301	200
Retailers	302	201
Insurance salesmen	311	210
Real estate agents and securities brokers	312	211
Marketing promoters	313	212
Commercial travellers	331	220,221,230
Shop personnel	332, 333	231
Other sales personnel	338	233,234,239
Agriculture, forestry and fishing work		
Farmers, silvic-, horticulturists	401	300
Farm supervisors	402,403,404	302,303,304
Livestock breeders	405,406,407,421,431,432	305,306,307,320,330,331
Agri- and horticultural workers	411-418	310,311,312,313,319
Forestry workers and log floaters	441	340
Mining and quarrying work	50	40
Transport and communications work		
Ship's masters, mates and pilots	601, 602	500,501
Engine officers	603	502
Deck and engine room crew	611	510,511
Airline pilots	621	520
Railway engine drivers	631	530
Railway and station personnel	632	550
Motor vehicle and tram drivers	633	540
Messengers, delivery boys	635	541
Bus and tram conductors	636	552
Harbour masters	641	560
Air traffic controllers	642	561,551
Railway traffic supervisors	643	562
Road transport supervisors	644	563
Post-office clerks	651	570
Telecommunication operators	652,655	573
Telephone operators	653, 655	572
Postmen and sorters	661	580,581
Office receptionists and messengers	662	582
Other occupations in transport	671,678	590,591,599
Manufacturing and related work		
Textile work	70	60
Cutting and sewing work	71	61
Shoe and leather work	72	62
Metal processing work	73	63
Fine mechanical work	74	64
Iron and metalware work	75	65

BEST COPY AVAILABLE

Electrical work	76	66
Woodwork	77	67
Painting work	78	68
Other building and constructor work	79	69
Graphic work	80	70
Glass, ceramic and clay work	81	71
Food and beverage work	82, 84	72, 74
Chemical processing work	83	73
Other manufacturing work	85	75
Other manual work (unskilled)	86,88	76,78,79
Stationary engine and machine work	87	77
Service work		
Firemen	901	800
Policemen	902	801
Customs officers and border guards	903	802
Prison guards	904	803
Other guards (civil duties)	908	804,809
Catering supervisors	911	810
Cooks	912	811
Kitchen assistants	913	812
Child care in families	914	813
Domestic helps	915	814
Hotel receptionists	916	890
Pursers and hostesses	917	880
Other housekeeping service work	918	816,881
Waiters	921	820,821
Building caretakers	931	830,839
Cleaners	932, 933	831,832
Hairdressers, barbers, beauticians	941	840,841
Bath attendants	942	842
Laundry workers	943	850
Pressing workers	944	851
Coaches and trainers	945	860
Photographers	946	870
Burial service workers	947	892
Other service work	948	899
Military officers	981	900
Occupation not specified	999,009,019,029,039,049, 059,069,079,089,099,119, 209,299,309,319,339,409, 419,439,609,639,649,659, 669,699,909,919,939,949	999,039

BEST COPY AVAILABLE

Appendix C: Similarity and domain indexes

Educations	Similarity index		Occupational domain index			
	Male	Female	Swe-male	Fin-male	Swe-female	Fin-female
Library science	1.00	1.00	1.61	1.54	1.26	1.39
Fine and applied arts	0.90	0.90	9.85	8.88	10.39	10.23
Theology	1.00	0.78	1.64	1.66	2.30	3.15
Humanities	0.90	0.84	11.89	4.52	10.70	3.16
Other arts and hum. prog.	0.65	0.52	39.72	5.99	15.30	3.93
Leisure time instruction	0.76	0.81	3.94	5.10	2.29	4.40
Pre-primary teacher training	0.99	1.00	2.83	1.99	1.46	1.51
Primary teacher training	1.00	1.00	1.39	1.28	1.24	1.23
Subject teacher training	1.00	1.00	1.45	1.67	1.28	1.51
Training in occup. subj.	1.00	0.95	1.81	1.52	3.21	1.27
Training in aesthetics subj.	0.99	0.99	1.76	2.16	1.61	2.44
Other teacher training	0.80	0.96	4.43	7.97	4.15	5.81
Business economics	0.59	0.52	9.82	5.45	8.49	8.38
Law	0.96	0.98	8.15	7.49	8.05	5.00
Journalism	0.98	0.99	1.71	2.05	1.67	1.82
Psychology	0.98	1.00	2.19	2.60	1.71	1.56
Social work	0.69	0.96	4.12	5.43	1.98	4.12
ADP	0.99	0.98	2.89	1.34	3.30	1.35
Social sciences	0.85	0.66	14.33	11.67	13.65	10.22
Study and LM guidance	0.19	0.08	2.43	1.16	2.06	1.08
Other SB-programmes	0.39	0.88	19.61	8.60	10.40	4.46
Architecture	1.00	1.00	1.45	1.30	1.49	1.26
Engineering/construction	0.95	0.93	4.02	4.45	5.50	4.74
Engineering/electro-tele	0.94	0.93	4.50	6.13	4.69	5.66
Engineering/mechanical	0.90	0.70	6.13	6.33	7.45	10.11
Engineering/chemical	0.78	0.87	10.49	7.93	6.71	8.34
Other engineering	0.79	0.54	12.39	11.05	11.02	10.45
Natural sciences	0.86	0.72	11.94	7.76	12.63	5.30
Polytechnical programmes	0.87	0.73	12.02	7.26	21.74	5.96
Other technical education	0.15	0.16	13.17	4.51	19.67	3.24
Ship's officer education	0.87	0.35	7.45	1.59	14.93	3.08
Other transport prog.	0.62	0.01	11.80	1.16	12.30	1.22
Pharmacology	0.93	0.95	3.83	1.41	2.85	1.30
Work therapy	0.95	1.00	1.55	1.60	1.28	1.28
Laboratory nursing	0.08	0.10	2.88	1.31	1.52	1.29
Medicine	1.00	1.00	1.18	1.23	1.15	1.09
Pharmaceutics	0.98	1.00	3.10	3.11	1.43	1.29
Physioteraphy	0.95	0.96	2.15	1.36	1.37	1.82
Basic nursing	0.99	1.00	2.03	1.48	1.37	1.22
Social care	0.65	0.10	4.39	4.28	2.16	1.67
Dental nursing	..	1.00	1.28	..	1.12	1.00
Dentistry	1.00	1.00	1.16	1.19	1.14	1.09
Veterinary medicine	1.00	1.00	1.56	1.33	1.28	1.32
Other health programmes	0.54	0.30	17.43	1.45	10.21	3.15
Agriculture programmes	0.86	0.78	9.17	5.73	4.67	5.25
Forestry programmes	0.74	0.88	7.30	2.62	7.17	4.52
Other agriculture etc. prog.	0.78	0.82	7.27	7.70	10.19	10.82
Police education	1.00	0.25	1.29	1.40	1.43	3.86
Military education	1.00	..	1.91	1.34	2.09	..
Other service education	0.16	0.53	9.55	6.83	4.60	8.68
Other tertiary programmes	0.76	0.82	31.48	11.00	18.39	4.88
Arts programmes	0.70	0.70	23.91	15.61	28.67	24.32
Teacher training	0.36	0.35	4.98	8.51	9.94	5.77

Business programmes	0.88	0.98	25.36	17.93	6.68	4.85
Social studies	0.52	0.89	25.28	18.02	8.02	11.48
Building technology	0.69	0.16	5.80	7.09	7.36	6.39
Electro/tele-technology	0.98	0.94	4.69	4.30	8.52	6.98
Energy/vehicle technology	0.98	0.80	4.57	6.57	8.95	20.32
Chemical technology	0.88	0.43	10.17	7.88	16.82	2.27
Textile technology	0.76	0.90	11.80	25.96	14.53	13.06
Wood technology	0.97	0.86	4.17	7.19	7.76	11.44
Food technology	0.97	0.91	4.89	6.28	8.27	6.67
Graphical technology	0.98	1.00	2.43	3.23	2.47	2.34
Other technical prog.	0.50	0.50	14.94	10.88	21.37	22.28
Maritime programmes	0.74	0.52	11.70	13.97	10.94	22.23
Vehicle programmes	0.98	0.99	3.95	2.11	4.34	2.45
Other transport prog.	0.13	0.14	8.33	9.27	5.82	6.91
Nursing	0.78	0.75	5.89	6.27	2.74	5.16
Dental nursing	0.91	1.00	3.33	2.03	1.44	1.34
Child care	0.18	0.12	6.39	7.53	2.55	3.31
Other health prog.	0.10	0.23	13.60	1.93	5.56	10.30
Agricultural etc. prog.	0.97	0.80	7.89	5.28	9.48	6.11
Hotel and catering	0.92	0.78	6.80	11.25	7.47	15.82
Fire fighting	0.99	0.32	1.99	1.30	6.74	1.16
Military prog.	0.49	..	27.48	2.53	8.33	..
Other service prog.	0.08	0.62	18.92	1.90	17.23	2.37
Other secondary prog.	0.12	0.57	26.14	2.00	20.69	6.00
Basic education	0.52	0.69	19.58	41.61	17.94	15.83
Unknown	0.82	0.83	23.28	19.68	24.96	17.48

Note: Due to rounding some similaty indexes appear to be 1.00

Domain index is calculated by using the probability that two persons having the same education are working in the same occupational group:

$$P_i = \sum_j f_{ij}^2 \ ,$$

where f_{ij} is the fraction of those with education *i* working in occupation *j*. Domain index

$$D_i = \frac{1}{P_i}$$

varies fron 1 to N, where N is the number of occupational groups.

In a similar way, the probability that two persons with different education are occupied in the same group can be calculated:

$$P_{i,ii} = \sum_j f_{ij} f_{iij} \ .$$

The similarity index is defined in relation to these two probabilities:

$$S_{i,ii} = \frac{P_{i,ii}}{\sqrt{P_i P_{ii}}} \ .$$

Similarity index equals 1 if education *i* and *ii* have identical occupational profiles. If there is not any common occupational groups, similarity index equals 0.

CEDEFOP — European Centre for the Development of Vocational Training

The matching of educational and occupational structures in Finland and Sweden

Final report

Sakari Ahola
University of Turku, Finland

CEDEFOP Dossier

Luxembourg: Office for Official Publications of the European Communities

1999 – 78 pp. – 21 x 29.7 cm

ISBN 92-828-8008-7

Cat. No: HX-24-99-825-EN-C

Free of charge — 6001 EN —

Venta • Salg • Verkauf • Πωλήσεις • Sales • Vente • Vendita • Verkoop • Venda • Myynti • Försäljning

BELGIQUE/BELGIË

Jean De Lannoy
Avenue du Roi 202/Koningslaan 202
B-1190 Bruxelles/Brussel
Tél. (32-2) 538 43 08
Fax (32-2) 538 08 41
E-mail: jean.de.lannoy@infoboard.be
URL: http://www.jean-de-lannoy.be

La librairie européenne/ De Europese Boekhandel
Rue de la Loi 244/Wetstraat 244
B-1040 Bruxelles/Brussel
Tél. (32-2) 295 26 39
Fax (32-2) 735 08 60
E-mail: mail@libeurop.be
URL: http://www.libeurop.be

Moniteur belge/Belgisch Staatsblad
Rue de Louvain 40-42/Leuvenseweg 40-42
B-1000 Bruxelles/Brussel
Tél. (32-2) 552 22 11
Fax (32-2) 511 01 84

DANMARK

J. H. Schultz Information A/S
Herstedvang 10-12
DK-2620 Albertslund
Tlf. (45) 43 63 23 00
Fax (45) 43 63 19 69
E-mail: schultz@schultz.dk
URL: http://www.schultz.dk

DEUTSCHLAND

Bundesanzeiger Verlag GmbH
Vertriebsabteilung
Amsterdamer Straße 192
D-50735 Köln
Tel. (49-221) 97 66 80
Fax (49-221) 97 66 82 78
E-Mail: vertrieb@bundesanzeiger.de
URL: http://www.bundesanzeiger.de

ΕΛΛΑΔΑ/GREECE

G. C. Eleftheroudakis SA
International Bookstore
Panepistimiou 17
GR-10564 Athina
Tel. (30-1) 331 41 80/1/2/3/4/5
Fax (30-1) 323 98 21
E-mail: elebooks@netor.gr

ESPAÑA

Boletín Oficial del Estado
Trafalgar, 27
E-28071 Madrid
Tel. (34) 915 38 21 11 (Libros).
913 84 17 15 (Suscrip.)
Fax (34) 915 38 21 21 (Libros).
913 84 17 14 (Suscrip.)
E-mail: clientes@com.boe.es
URL: http://www.boe.es

Mundi Prensa Libros, SA
Castelló, 37
E-28001 Madrid
Tel. (34) 914 36 37 00
Fax (34) 915 75 39 98
E-mail: libreria@mundiprensa.es
URL: http://www.mundiprensa.com

FRANCE

Journal officiel
Service des publications des CE
26, rue Desaix
F-75727 Paris Cedex 15
Tél. (33) 140 58 77 31
Fax (33) 140 58 77 00
URL: http://www.journal-officiel.gouv.fr

IRELAND

Government Supplies Agency
Publications Section
4-5 Harcourt Road
Dublin 2
Tel. (353-1) 661 31 11
Fax (353-1) 475 27 60

ITALIA

Licosa SpA
Via Duca di Calabria, 1/1
Casella postale 552
I-50125 Firenze
Tel. (39) 055 64 83 1
Fax (39) 055 64 12 57
E-mail: licosa@ftbcc.it
URL: http://www.ftbcc.it/licosa

LUXEMBOURG

Messageries du livre SARL
5, rue Raiffeisen
L-2411 Luxembourg
Tel. (352) 40 10 20
Fax (352) 49 06 61
E-mail: mail@mdl.lu
URL: http://www.mdl.lu

NEDERLAND

SDU Servicecentrum Uitgevers
Christoffel Plantijnstraat 2
Postbus 20014
2500 EA Den Haag
Tel. (31-70) 378 98 80
Fax (31-70) 378 97 83
E-mail: sdu@sdu.nl
URL: http://www.sdu.nl

ÖSTERREICH

Manz'sche Verlags- und Universitätsbuchhandlung GmbH
Kohlmarkt 16
A-1014 Wien
Tel. (43-1) 53 16 11 00
Fax (43-1) 53 16 11 67
E-Mail: bestellen@manz.co.at
URL: http://www.manz.at/index.htm

PORTUGAL

Distribuidora de Livros Bertrand Ld.ª
Grupo Bertrand, SA
Rua das Terras dos Vales, 4-A
Apartado 60037
P-2700 Amadora
Tel. (351-1) 495 90 50
Fax (351-1) 496 02 55

Imprensa Nacional-Casa da Moeda, EP
Rua Marquês Sá da Bandeira, 16-A
P-1050 Lisboa Codex
Tel. (351-1) 353 03 99
Fax (351-1) 353 02 94
E-mail: del.incm@mail.telepac.pt
URL: http://www.incm.pt

SUOMI/FINLAND

Akateeminen Kirjakauppa/ Akademiska Bokhandeln
Keskuskatu 1/Centralgatan 1
PL/PB 128
FIN-00101 Helsinki/Helsingfors
P. /tfn (358-9) 121 44 18
F./fax (358-9) 121 44 35
Sähköposti: akatilaus@akateeminen.com
URL: http://www.akateeminen.com

SVERIGE

BTJ AB
Traktorvagen 11
S-221 82 Lund
Tfn (46-46) 18 00 00
Fax (46-46) 30 79 47
E-post: btjeu-pub@btj.se
URL: http://www.btj.se

UNITED KINGDOM

The Stationery Office Ltd
International Sales Agency
51 Nine Elms Lane
London SW8 5DR
Tel. (44-171) 873 90 90
Fax (44-171) 873 84 63
E-mail: ipa-enquiries@theso.co.uk
URL: http://www.the-stationery-office.co.uk

ISLAND

Bokabud Larusar Blondal
Skolavordustig, 2
IS-101 Reykjavik
Tel. (354) 551 56 50
Fax (354) 552 55 60

NORGE

Swets Norge AS
Østenjoveien 18
Boks 6512 Etterstad
N-0606 Oslo
Tel. (47-22) 97 45 00
Fax (47-22) 97 45 45

SCHWEIZ/SUISSE/SVIZZERA

Euro Info Center Schweiz
c/o OSEC
Stampfenbachstraße 85
PF 492
CH-8035 Zürich
Tel. (41-1) 365 53 15
Fax (41-1) 365 54 11
E-mail: eics@osec.ch
URL: http://www.osec.ch/eics

BÁLGARIJA

Europress Euromedia Ltd
59, blvd Vitosha
BG-1000 Sofia
Tel. (359-2) 980 37 66
Fax (359-2) 980 42 30
E-mail: Milena@mbox.cit.bg

ČESKÁ REPUBLIKA

USIS
NIS-prodejna
Havelkova 22
CZ-130 00 Praha 3
Tel. (420-2) 24 23 14 86
Fax (420-2) 24 23 11 14
E-mail: nkposp@dec.nis.cz
URL: http://usiscr.cz

CYPRUS

Cyprus Chamber of Commerce and Industry
PO Box 1455
CY-1509 Nicosia
Tel. (357-2) 66 95 00
Fax (357-2) 66 10 44
E-mail: demetrap@ccci.org.cy

EESTI

Eesti Kaubandus-Toostuskoda (Estonian Chamber of Commerce and Industry)
Toom-Kooli 17
EE-0001 Tallinn
Tel. (372) 646 02 44
Fax (372) 646 02 45
E-mail: einfo@koda.ee
URL: http://www.koda.ee

HRVATSKA

Mediatrade Ltd
Pavla Hatza 1
HR-10000 Zagreb
Tel. (385-1) 481 94 11
Fax (385-1) 481 94 11

MAGYARORSZÁG

Euro Info Service
Európa Ház
Margitsziget
PO Box 475
H-1396 Budapest 62
Tel. (36-1) 350 80 25
Fax (36-1) 350 90 32
E-mail: euroinfo@mail.matav.hu
URL: http://www.euroinfo.hu/index.htm

MALTA

Miller Distributors Ltd
Malta International Airport
PO Box 25
Luqa LQA 05
Tel. (356) 66 44 88
Fax (356) 67 67 99
E-mail: gwirth@usa.net

POLSKA

Ars Polona
Krakowskie Przedmiescie 7
Skr. pocztowa 1001
PL-00-950 Warszawa
Tel. (48-22) 826 12 01
Fax (48-22) 826 62 40
E-mail: ars_pol@bevy.hsn.com.pl

ROMÂNIA

Euromedia
Str. G-ral Berthelot Nr 41
RO-70749 Bucuresti
Tel. (40-1) 315 44 03
Fax (40-1) 314 22 86

ROSSIYA

CCEC
60-letiya Oktyabrya Av. 9
117312 Moscow
Tel. (7-095) 135 52 27
Fax (7-095) 135 52 27

SLOVAKIA

Centrum VTI SR
Nam. Slobody, 19
SK-81223 Bratislava
Tel. (421-7) 54 41 83 64
Fax (421-7) 54 41 83 64
E-mail: europ@tbb1.sltk.stuba.sk
URL: http://www.sltk.stuba.sk

SLOVENIJA

Gospodarski Vestnik
Dunajska cesta 5
SLO-1000 Ljubljana
Tel. (386) 613 09 16 40
Fax (386) 613 09 16 45
E-mail: europ@gvestnik.si
URL: http://www.gvestnik.si

TURKIYE

Dünya Infotel AS
100, Yil Mahallessi 34440
TR-80050 Bagcilar-Istanbul
Tel. (90-212) 629 46 89
Fax (90-212) 629 46 27
E-mail: infotel@dunya-gazete.com.tr

AUSTRALIA

Hunter Publications
PO Box 404
3067 Abbotsford, Victoria
Tel. (61-3) 94 17 53 61
Fax (61-3) 94 19 71 54
E-mail: jpdavies@ozemail.com.au

CANADA

Les éditions La Liberté Inc.
3020, chemin Sainte-Foy
G1X 3V Sainte-Foy, Québec
Tel. (1-418) 658 37 63
Fax (1-800) 567 54 49
E-mail: liberte@mediom.qc.ca

Renouf Publishing Co. Ltd
5369 Chemin Canotek Road Unit 1
K1J 9J3 Ottawa, Ontario
Tel. (1-613) 745 26 65
Fax (1-613) 745 76 60
E-mail: order.dept@renoufbooks.com
URL: http://www.renoufbooks.com

EGYPT

The Middle East Observer
41 Sherif Street
Cairo
Tel. (20-2) 392 69 19
Fax (20-2) 393 97 32
E-mail: mafouda@meobserver.com.eg
URL: http://www.meobserver.com.eg

INDIA

EBIC India
3rd Floor, Y. B. Chavan Centre
Gen. J. Bhosale Marg.
400 021 Mumbai
Tel. (91-22) 282 60 64
Fax (91-22) 285 45 64
E-mail: ebic@giasbm01.vsnl.net.in
URL: http://www.ebicindia.com

ISRAËL

ROY International
41, Mishmar Hayarden Street
PO Box 13056
61130 Tel Aviv
Tel. (972-3) 649 94 69
Fax (972-3) 648 60 39
E-mail: royil@netvision.net.il
URL: http://www.royint.co.il

Sub-agent for the Palestinian Authority

Index Information Services
PO Box 19502
Jerusalem
Tel. (972-2) 627 16 34
Fax (972-2) 627 12 19

JAPAN

PSI-Japan
Asahi Sanbancho Plaza #206
7-1 Sanbancho, Chiyoda-ku
Tokyo 102
Tel. (81-3) 32 34 69 21
Fax (81-3) 32 34 69 15
E-mail: books@psi-japan.co.jp
URL: http://www.psi-japan.com

MALAYSIA

EBIC Malaysia
Level 7, Wisma Hong Leong
18 Jalan Perak
50450 Kuala Lumpur
Tel. (60-3) 262 62 98
Fax (60-3) 262 61 98
E-mail: ebic-kl@mol.net.my

MÉXICO

Mundi Prensa Mexico, SA de CV
Río Panuco No 141
Colonia Cuauhtémoc
MX-06500 Mexico, DF
Tel. (52-5) 533 56 58
Fax (52-5) 514 67 99
E-mail: 101545.2361@compuserve.com

PHILIPPINES

EBIC Philippines
19th Floor, PS Bank Tower
Sen. Gil J. Puyat Ave. cor. Tindalo St.
Makati City
Metro Manila
Tel. (63-2) 759 66 80
Fax (63-2) 759 66 90
E-mail: eccpcom@globe.com.ph
URL: http://www.eccp.com

SRI LANKA

EBIC Sri Lanka
Trans Asia Hotel
115 Sir chittampalam
A. Gardiner Mawatha
Colombo 2
Tel. (94-1) 074 71 50 78
Fax (94-1) 44 87 79
E-mail: ebicsl@itmin.com

THAILAND

EBIC Thailand
29 Vanissa Building, 8th Floor
Soi Chidlom
Ploenchit
10330 Bangkok
Tel. (66-2) 655 06 27
Fax (66-2) 655 06 28
E-mail: ebicbkk@ksc15.th.com
URL: http://www.ebicbkk.org

UNITED STATES OF AMERICA

Bernan Associates
4611-F Assembly Drive
Lanham MD20706
Tel. (1-800) 274 44 47 (toll free telephone)
Fax (1-800) 865 34 50 (toll free fax)
E-mail: query@beman.com
URL: http://www.beman.com

ANDERE LÄNDER/OTHER COUNTRIES/ AUTRES PAYS

Bitte wenden Sie sich an ein Büro Ihrer Wahl/ Please contact the sales office of your choice/ Veuillez vous adresser au bureau de vente de votre choix

Office for Official Publications of the European Communities
2, rue Mercier
L-2985 Luxembourg
Tel. (352) 29 29-42455
Fax (352) 29 29-42758
E-mail: info.info@opoce.cec.be
URL: http://eur-op.eu.int

BEST COPY AVAILABLE

HX-24-99-825-EN-C

The matching of educational and occupational structures in Finland and Sweden

Final report

This study report has been commissioned by CEDEFOP in the framework of its Ciretoq network on trends in occupations and qualifications to the Research Unit on Sociology of Education at the University of Turku. The Swedish Statistical Office made available its database in order to permit the necessary comparisons between Finland and Sweden. The main work has been performed by RUSE, however.

The study shows the usefulness of such a comparison because it permits insights into a number of important elements linked to common as well as to certain contradictory developments. It is, for instance, highly interesting to note that in both countries we seem to have, to a large degree, a 'mismatch' between delivery of qualifications and their actual employment characteristics; and at the same time we can affirm a rather high overlap in the actual use of different qualifications within the same occupational domain, which the author is calling 'multimatch'. It is thus highly questionable whether, and how far, the often heard plea for a closer 'matching' of educational qualifications and occupational domains or structures is realistic any more.

The contradictions go further: In certain fields we seem to have a widening of occupational domains; in others, however, we have a narrowing down of occupational domains by respective qualifications. Real specialists in VET-policy and guidance are therefore either pleading for a too narrow specialisation or for an often rather superficial flexibility; they eventually plead for a 'flexible specialisation' during initial education and training, a plea which could form the major conclusion of this work.

Free of charge – 6001 EN

CEDEFOP

European Centre for the Development of Vocational Training

Evropis 123, GR-57001 THESSALONIKI (Pylea)
Postal address:
PO Box 22427, GR-55102 THESSALONIKI
Tel. (30-31) 490 111 Fax (30-31) 490 020 E-mail: info@cedefop.gr
Homepage: www.cedefop.gr Interactive website: www.trainingvillage.gr

OFFICE FOR OFFICIAL PUBLICATIONS
OF THE EUROPEAN COMMUNITIES

L-2985 Luxembourg

ISBN 92-828-8008-7

9 789282 880081 >